AMERICA'S LARGEST TEXTILE MONTHLY

COTTON

IN THE HEART OF THE

MANUFACTURING SOUTH

LIBRARY OF CONGRESS
MAR 3
DEPOSIT

ONE MOVEMENT of PREPARATION BETWEEN PRODUCER and CONSUMER

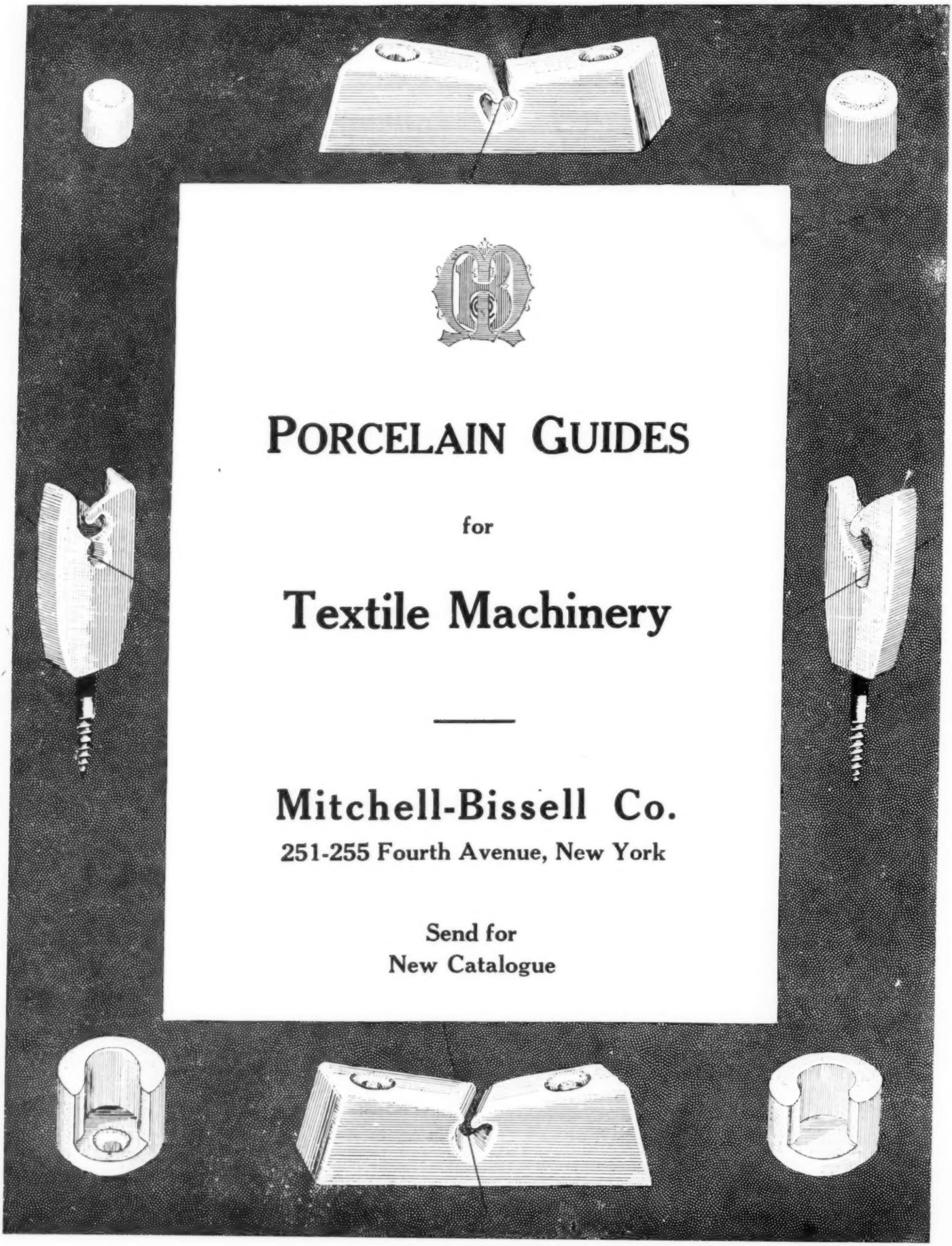
ECT WHOLESALE CONTRACTORS
m SOUTHERN COTTON MILLS

DIRECT WHOLESALE FURNISHERS
To ALL COTTON WASTE USERS

FEBRUARY
1920

TEN CENTS
A COPY

Published Monthly by
W.R.C. Smith Pub. Co.
Dallas & Atlanta, Ga.



Entered as second-class matter at the
Postoffice, Dalton, Ga., under Act of March 3, 1879

NORTHROP
TRADE-MARK
LOOM REPAIRS

OUR loom repairs are made from the same patterns as the parts that they replace on the Northrop looms; they are machined with the same tools, jigs and fixtures; they are made from the same high grade materials

Repairs made under our conditions **ARE** better than those made in job foundries and shops and without our interest in the working of the Northrop loom

Draper Corporation service goes with our goods

Our prices for loom and other repairs are low

We carry several hundred tons of Finished Loom repairs n stock for the convenience of our customers

DRAPER CORPORATION
HOPEDALE MASSACHUSETTS

Southern Office:
188 South Forsyth Street Atlanta Georgia

Copyright 1917 by Draper Corporation

ONE SOLUTION OF THAT

In the past few years wages have gone up by "leaps and bounds." Some method to meet this increase in operating costs should be put into action at once.

The most logical solution to this problem is to make your highly paid men more productive. Even the most highly paid men can not increase their production on antiquated, plain bearing looms. The looms are constantly being shut down for repairs, causing a loss in production and the worker's time.

Better looms---Hyatt equipped looms---run easier, reduce power and lubrication costs, eliminate bearing replacements and are durable and dependable. Hyatt Roller Bearings enable greater production and full utilization of every man's time.

If you want to increase production, your looms should be Hyatt equipped. The next time you order looms, specify Hyatt Bearings. Send for our Engineering data at once.

1945

MOTOR BEARINGS DIVISION
DETROIT, MICHIGAN

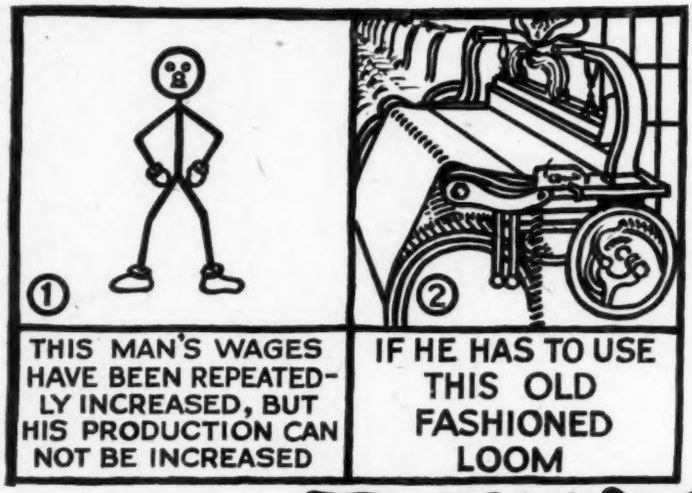
HYATT ROLLER BEARING COMPANY
INDUSTRIAL BEARINGS DIVISION
NEW YORK, N. Y.

TRACTOR BEARINGS DIVISION
CHICAGO, ILLINOIS

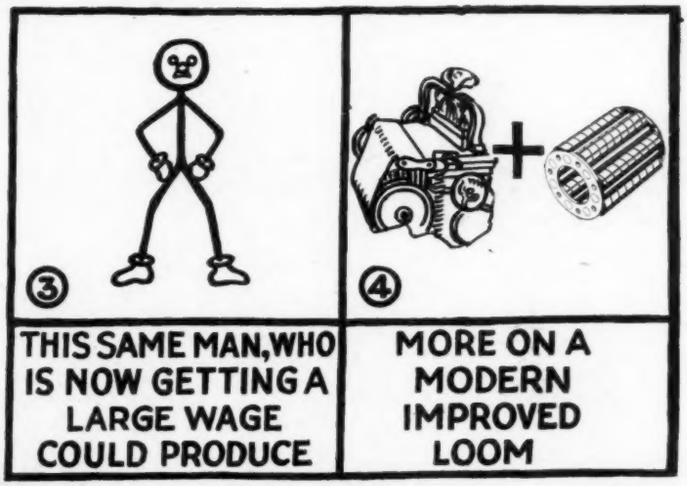
Manufacturers of Bearings for Mine Cars, Ore Cars, Steel Mill Cars, Roller Tables, Trolleys, Cranes, Hoists, Machine Tools, Line Shafts, Countershafts, Concrete Machinery, Textile Machinery, Conveyors, Lift Trucks, Industrial Trucks, Railway Service Cars, Storage Battery Locomotives, etc.

HYATT BEARINGS

HIGH WAGE PROBLEM


1
2
THIS MAN'S WAGES HAVE BEEN REPEATEDLY INCREASED, BUT HIS PRODUCTION CAN NOT BE INCREASED
IF HE HAS TO USE THIS OLD FASHIONED LOOM

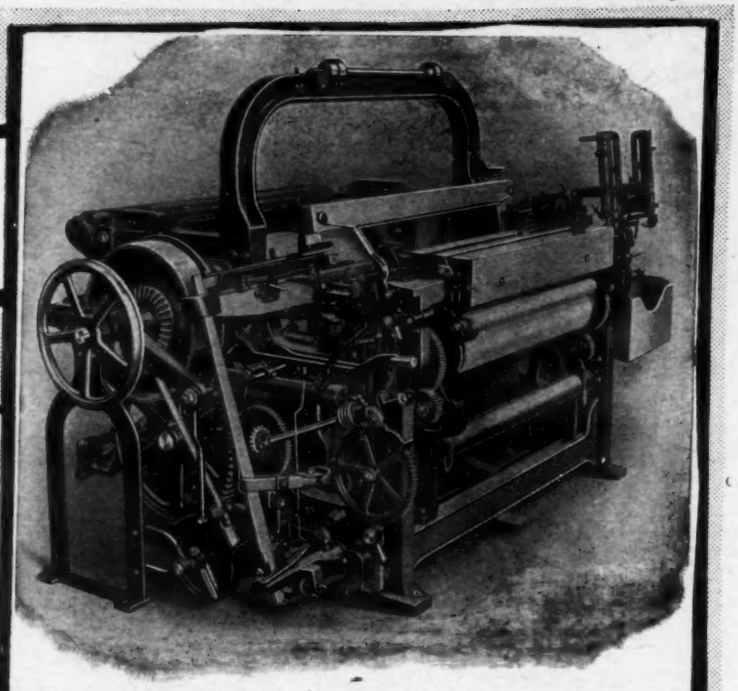
BUT



Which is One Solution of the "High Wage" Problem

FOR LOOMS

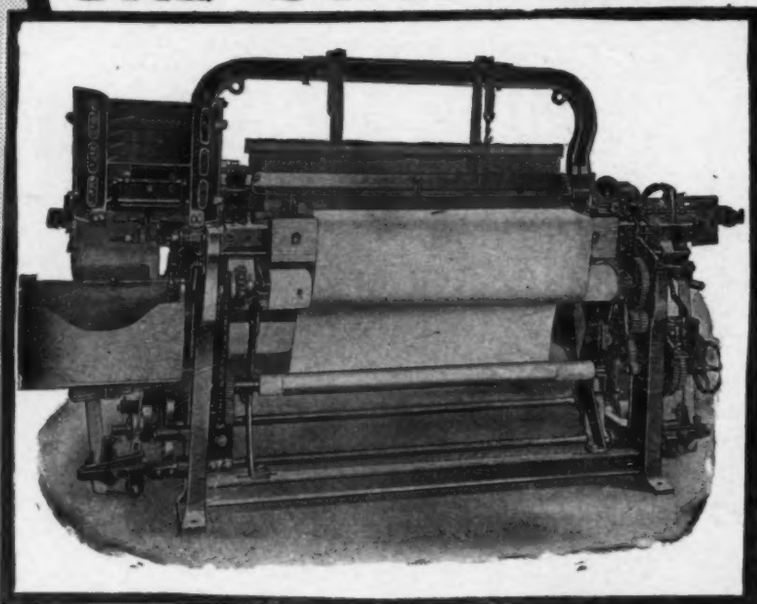
Dependable Looms



STAFFORD DUCK LOOM

The Stafford Company for a great many years has concentrated on the production of a strictly practical loom. Convincing proof of the soundness of this idea is found in the large list of repeat orders for Stafford looms from a steadily growing list of progressive mills both in this country and Canada.

THE STAFFORD COMPANY



Readville
Mass.

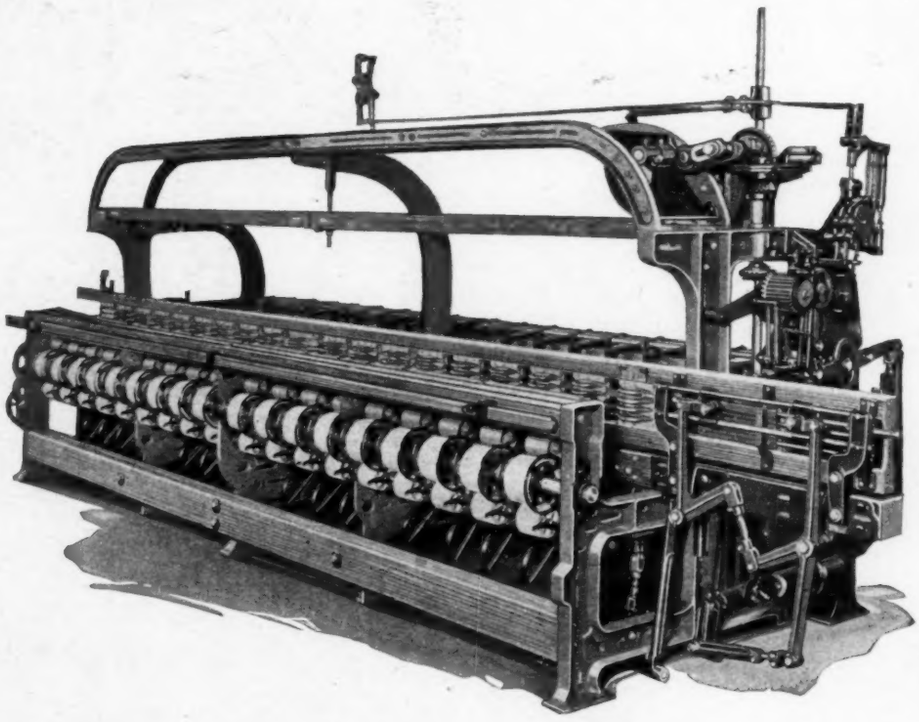
Southern Agent
J. H. MAYES
Charlotte
N. C.

Shorten the Way—

Production in any line of textile work begins in a winding path which follows the line of least resistance. It takes time and the minds of many men to span the gulf between the family output with spinning wheel and hand loom and the modern factory output with power driven looms where one operator produces more in one day than an entire family once did in a year.

The sturdy construction and the careful design of Fletcher looms shorten the way to profit because they operate easily and without interruption, because one operator can take care of two or more machines with a minimum of attention.

There are still more reasons why, write for them.



FLETCHER WORKS

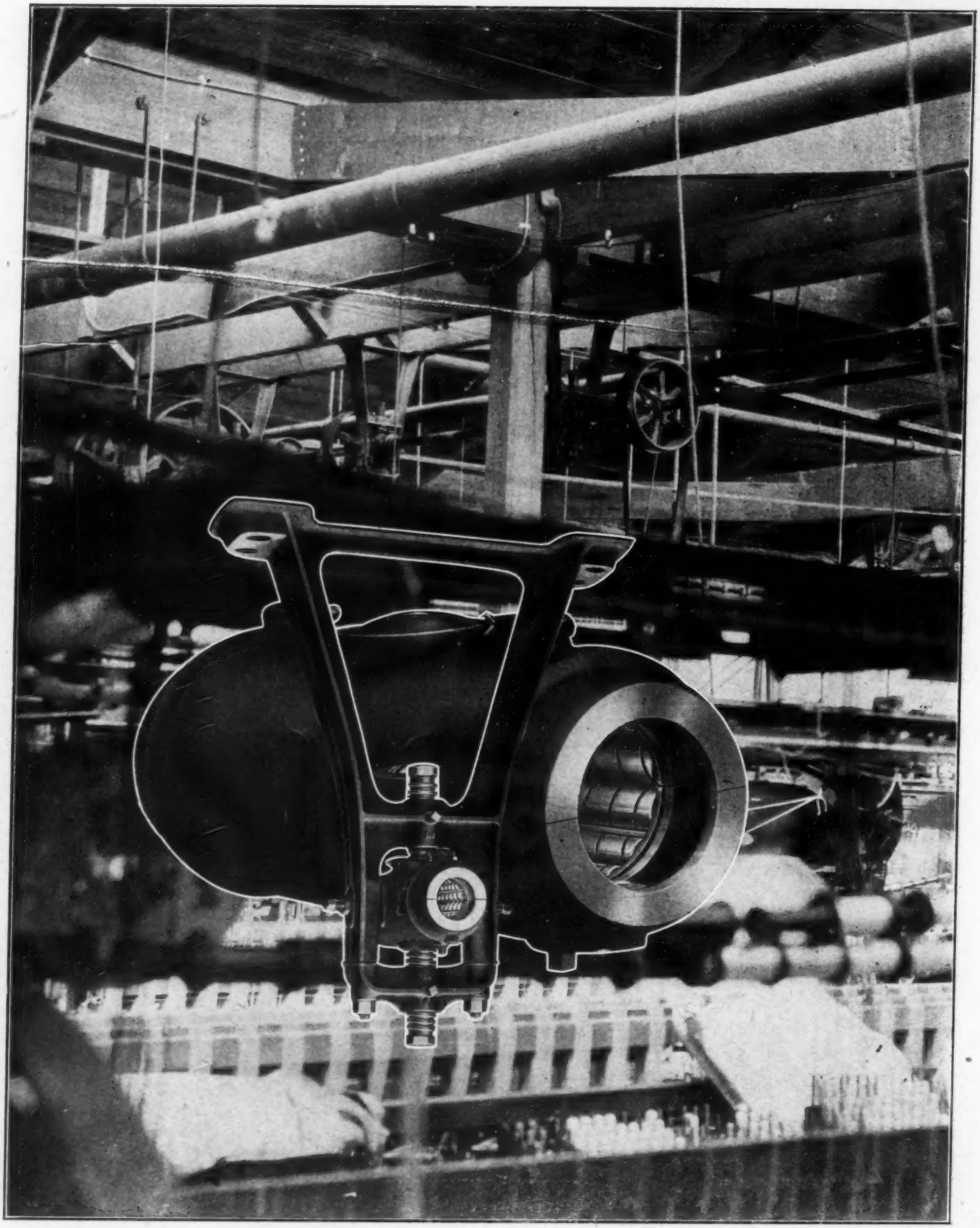
Formerly Schaum & Uhlinger

Glenwood Ave. and Second Street

PHILADELPHIA, U. S. A.

A four bank label loom combining high speed, simple but rigid construction, low upkeep and a large volume output. One operator can run two looms.

F-L-101B



HYATT BEARINGS

Like Old Wine They Improve With Age

If you wanted a smooth drink, you wouldn't order a new bottle of wine. You'd get out an old bottle covered with cobwebs--a wine that had improved with age.

You know that Hyatt Roller Bearing Hangers are easy running, have a positive oiling action and save power. But do you realize how durable they are—how many years of service they give? In some plants they have been in operation for 29 years and are still going strong.

If you had installed Hyatt Roller Bearing Hangers 29 years ago you could point with pride today to those same hangers that have kept running year after year with a minimum amount of attention.

The first cost of Hyatt Roller Bearing Hangers is very little more than the first cost of plain bearings. The years of dependable service they give make them a real investment.

If you want standardized transmission equipment—equipment that will last as long as your machines—specify Hyatt Roller Bearing Hangers. Send for our Bulletin No. 125 today.

MOTOR BEARINGS DIVISION DETROIT, MICH.

HYATT ROLLER BEARING COMPANY INDUSTRIAL BEARINGS DIVISION NEW YORK, N. Y.

TRACTOR BEARINGS DIVISION CHICAGO, ILL.

Manufacturers of bearings for mine cars, ore cars, steel mill cars, roller tables, trolleys, cranes, hoists, machine tools, line shafts, countershafts, concrete machinery, textile machinery, conveyors, lift trucks, industrial trucks, railway service cars, storage battery locomotives, etc

C-133

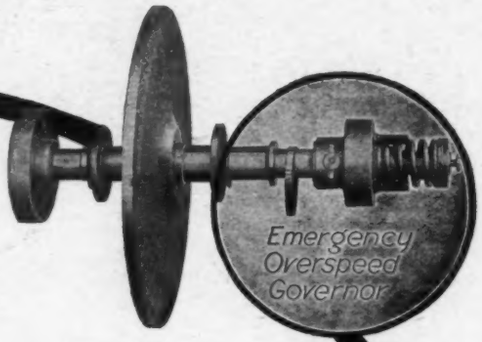
FOR LINE SHAFTS

Westinghouse

Mechanical-Drive Turbines
15 to 500 hp.
For Driving Pumps, Fans, Blowers, Etc.

New Features Series Feature No. 4

Safety Features



In addition to the powerful Centrifugal Governor for speed control, the Westinghouse Mechanical Drive Turbine is also equipped with—

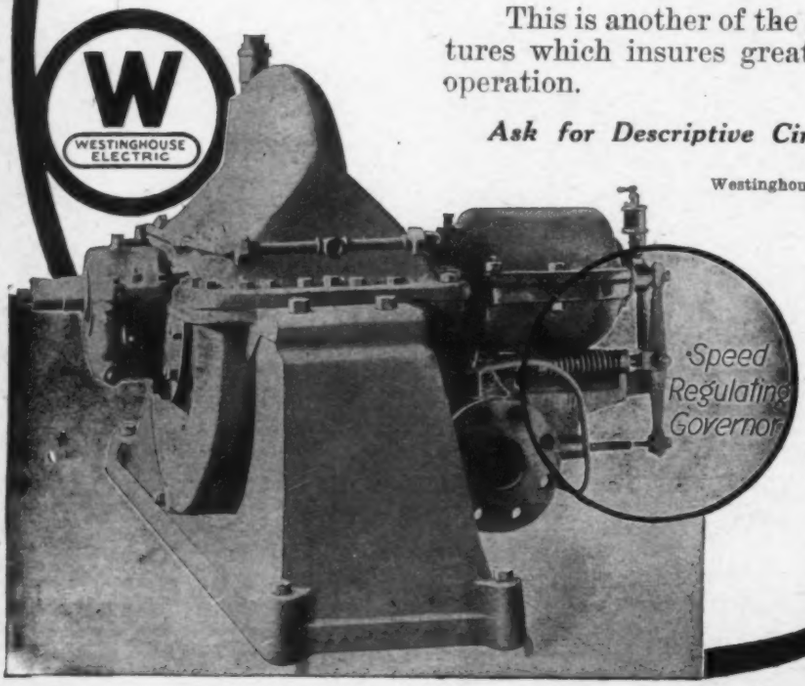
An Emergency Over-Speed Governor

—which automatically shuts down the turbine should the speed-regulating governor fail to function from causes beyond control.

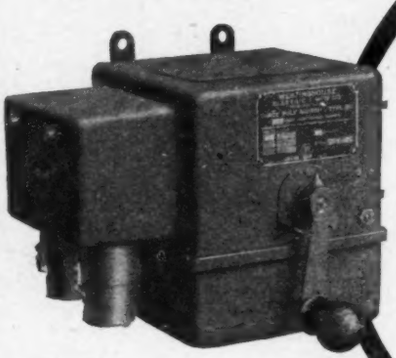
This is another of the several important features which insures greater certainty of plant operation.

Ask for Descriptive Circular No. 3707-A

Westinghouse Electric & Manufacturing Co.
East Pittsburgh, Pa.



Safety First



WESTINGHOUSE ELECTRIC

Type 815 and 816

Starting Switches for Squirrel Cage Motors from 1/2 to 25 H.P

Safety First

Protect Your Employees And Your Equipment—

A BIG INSURANCE AT SMALL COST

The Type 815 and 816 Starting Switches—

—**Protect** the operator from shocks and burns.

—**Protect** the motor against burnouts due to overloads or single phase operation.

—**Protect** operator and equipment from injury due to unexpected or accidental starting of motor.

—**Protect** themselves by fool-proof construction and operation, eliminating those annoying shutdowns.

The cost of rewinding one 5-h.p. motor—not considering the idleness of expensive labor and machinery—will more than pay for the starter.

Ask for Descriptive Leaflet 1441-A

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

702

Westinghouse

SACO-LOWELL CARD STRIPPER

DUSTLESS AND AUTOMATIC

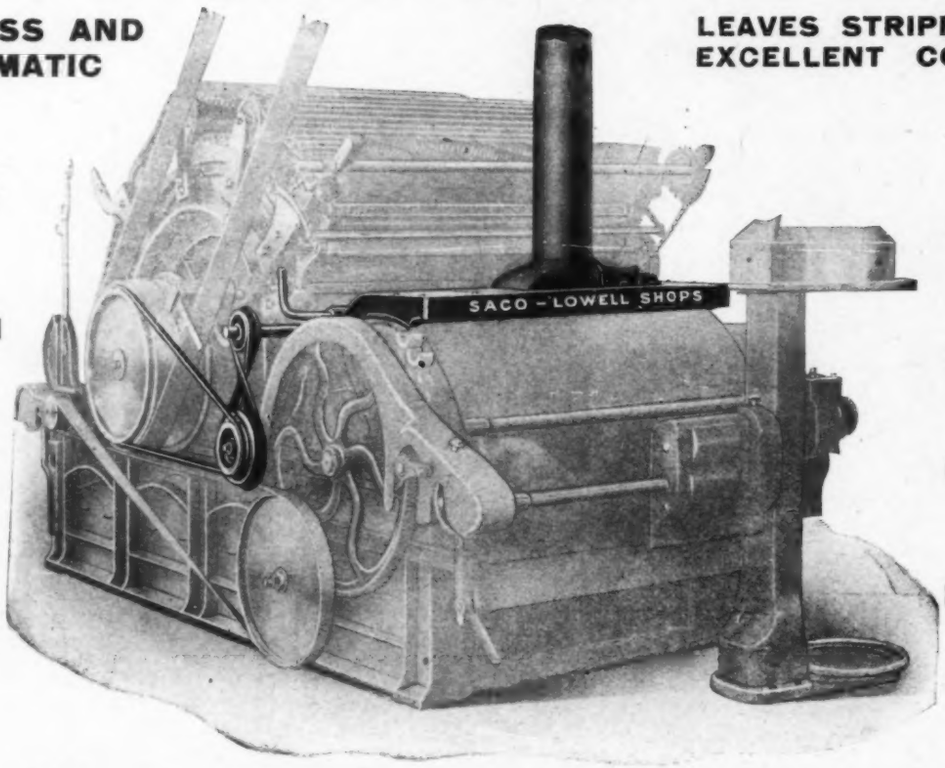
LEAVES STRIPPINGS IN EXCELLENT CONDITION

Economical to Operate

Saves Time and Labor

Strips Card Clean

Sanitary and Efficient



Low Cost of Maintenance

Simple, Durable Practical

Control Always Absolute

Full Information Furnished

Rogers W. Davis, Southern Agent CHARLOTTE, N. C. **Saco-Lowell Shops, Newton Upper Falls, Mass.** Southern Branch Office GREENVILLE, S. C.

SPINNING RING SPECIALISTS SINCE 1873

SPINNING RINGS
TWISTER RINGS
SILK RINGS

DIAMOND FINISH

TRAVELLER CLEANERS
TRAVELLER CUPS
GUIDE WIRE SETS

WHITINSVILLE SPINNING RING CO.
WHITINSVILLE, MASS.

CORBITT MOTOR TRUCKS

Exactingly built for one ordered purpose---to master staggering hauling problems---to keep them mastered at exceptionally low up-keep costs.

Corbitt Motor Trucks are alert Hauling Giants, easily performing the hardest transportation tasks, getting your work done on time regardless of roads or loads, keeping your costs down and your profits up.

Resolute Power Without Clumsiness

The man who buys any other Motor Truck without carefully investigating a Corbitt is denying his business the advantage of having a Motor Truck which is built to lengthen service and shorten hauling costs.

Oettinger Lumber Co., Elon College, N. C., 2-11-19.
Greensboro, N. C.

Replying to your letter of the 10th will say that our 2½ ton Corbitt Truck has given us good service. If you buy one and give it any care and attention at all you will get good results from it. We believe it is as good as any truck made and a whole lot better than many.

(Signed) HOLT, GANT AND HOLT COTTON MFG. CO.
By Jos. Erwin Gant.

There is a Corbitt Truck for every kind of business. Let us help you make an efficient selection of one for your business. Write for the new Corbitt Catalog.

CORBITT MOTOR TRUCK COMPANY

Manufacturers

HENDERSON, NORTH CAROLINA

The Corbitt Specification Comparison chart is the most correct question answerer ever devised for safe purchasing of Motor Trucks. Use the coupon or write today.

CLIP AND MAIL THIS COUPON

Corbitt Motor Truck Co.: Send your Specification Comparison Chart by which a motor truck may be chosen without the slightest detail left to chance.

Name .....

Address .....

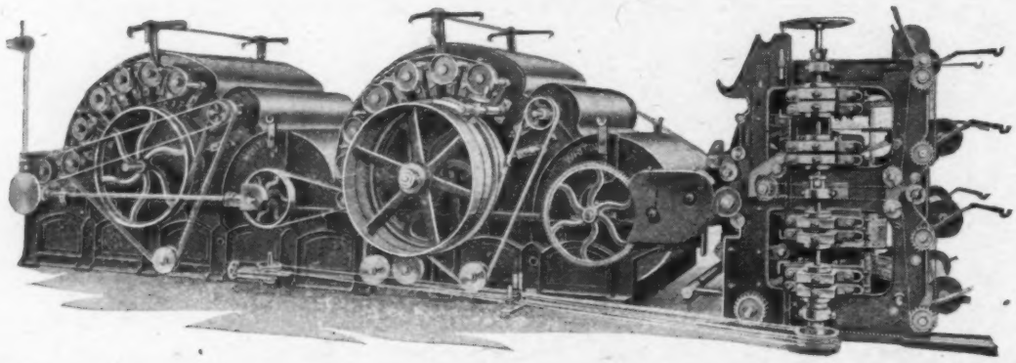
WHITIN MACHINE WORKS

ESTABLISHED 1831

TEXTILE MACHINERY

MANUFACTURERS OF

Complete Condenser Plants for Wool and Cotton Waste Yarns



Intermediate and Finisher Cards with Four-Bank Condenser

MAIN OFFICE AND WORKS

WHITINSVILLE, MASS., U.S.A.

SOUTHERN OFFICE CHARLOTTE N. C.

Thacker Warp Stop Motion Frame

Attachment used whereby open drop wires can be drawn in at frame and transferred to loom as readily and safely as are the closed drop wires

We Offer to the Trade a New Bobbin Stripper for Automatic Loom Bobbins.

Crompton & Knowles Loom Works

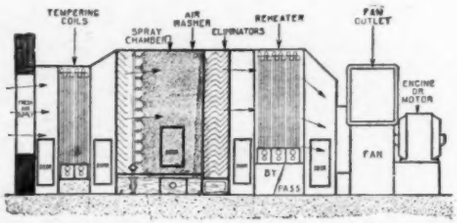
Worcester, Mass.

Providence, R. I. Philadelphia, Pa. Paterson, N. J.

Southern Representatives---Alexander & Garsed, Charlotte, N. C.
South American Representatives---W. R. Grace & Co., New York

LOST WEIGHT—SMALLER PROFITS

You cannot afford to let your yarn lose weight in these days of high production costs. It is absolutely essential that constant temperature and humidity be maintained throughout your mill in every step—from opener picker to cloth baler. Outside weather conditions are too unreliable for even production, and those who watch profit and loss statements recognize the importance of maintaining even temperature and sufficiently high humidity day in and day out.



Sturtevant
REG. U. S. PAT. OFF.

AIR CONDITIONING SYSTEMS

guarantee even weight from start to finish with the added advantages of eliminating static; of keeping the "fluff" out of the air, and of giving your employees healthy air to breathe. Together with the W. L. Fleisher engineering and construction organization we manufacture and install these systems.

The Fleisher symbol means able service; the Sturtevant trade-mark means reliable apparatus. Let us help you

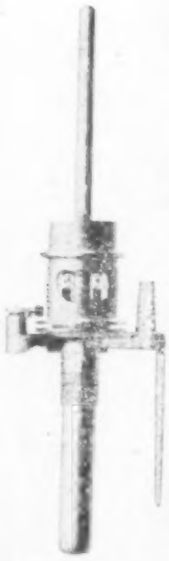
B. F. STURTEVANT COMPANY
HYDE PARK, BOSTON, MASSACHUSETTS
AND ALL PRINCIPAL CITIES

Make Your Twister Frames Work Harder

With Less Power, Less Wear, Less Expense,

HOW? By Installing

Allen Ball Bearing Twister Spindles.



Fitted to old frames without changing spools or drive.

The question of *greater production* at less cost answered.

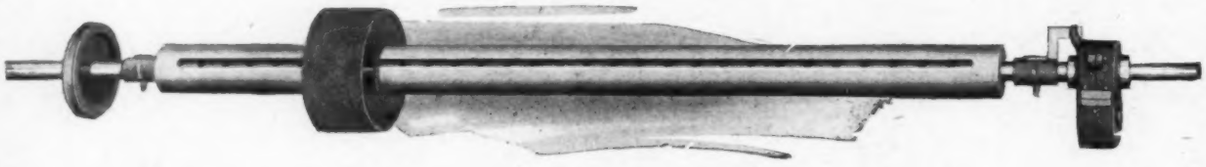
ALLEN SPINDLE CORPORATION

ELLIOTT A. ALLEN
President

80 BOYLSTON ST.
BOSTON, MASS.

STANDARD TYPE
SPINDLES

Textile Grinding Machinery of All Kinds



Send in Your Old Grinders to be Repaired

Southern Agent, E. M. Terryberry, C-o Howard Mfg., Co.,
1126 Healy Bldg., Atlanta, Ga.

B.S. ROY & SON COMPANY

WORCESTER, MASS.

Established 1868

"Sirocco"
TRADE MARK

At the Avalon Knitwear Plant

where some of the industry's finest materials are woven, careful result-producing studies have been made of the air and the proper disposal of "fly" and dust thruout the plant.

The result of these studies convinced the management that the right kind of air conditioning equipment would mean more healthful surroundings and better opportunities for careful work for the employes and the elimination from a mechanical standpoint of excessive breakage, "ends," and wastage. As a result "Sirocco" equipment was installed.

The Avalon Knitwear plant is only one of many in the textile industry in which "Sirocco" systems are in use. Keeping the air clear and free from foreign substances insures keener, healthier workmen and better finished products. In the summer months this equipment can be used to supply fresh, clear, cooled air to all departments of the plant, and in the winter, pure air warmed to the proper temperature can likewise be supplied.

One big production problem of the textile mill can be eliminated by the right kind of ventilating and air conditioning equipment. We are prepared to give you definite information of value to you, provided you will give us the opportunity.

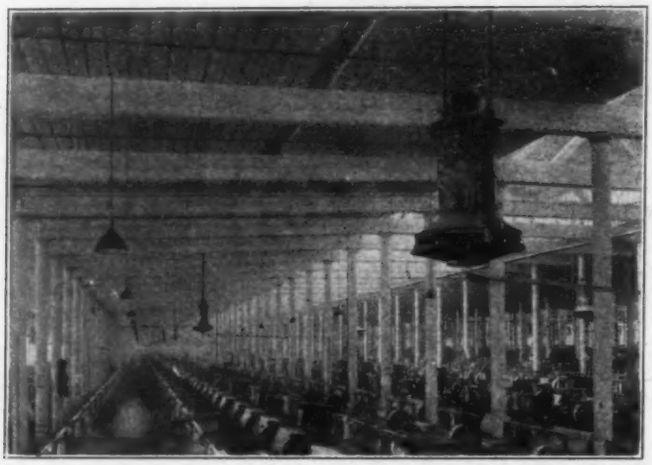
American Blower Company

DETROIT, MICH.

Canadian Sirocco Company, Ltd.
Windsor, Ont.

BRANCHES IN ALL LARGE CITIES

Is Your Humidifier System Profitable?



Parks-Cramer Humidifiers in the largest weave shed in the South. 138,000 spindles 245 cards, 3000 looms.

Don't think, just because you have a humidifying equipment, that you have gotten all there is out of it—that you cannot make humidification more profitable to you.

One manufacturer who was already equipped with a humidifying system that he thought was perfect as possible, installed Parks-Cramer equipment and saved $28,000.00 the first year.

We have made much and exhaustive study of the subject—have learned much during the past few years particularly—and feel sure that, even if you now have humidifiers, there is something more in humidification for you, something that means more profits.

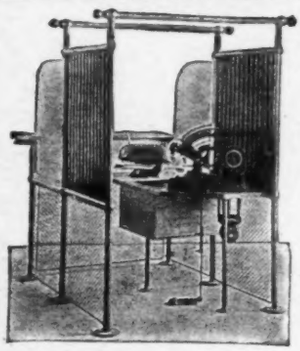
The only way to know whether your equipment is bad or good is to let a specialist look it over and dissect your problem not only scientifically but professionally. You want to have the best system—best fitted to your particular problem. Avail yourself of our experience and service.

Parks-Cramer Company

Fitchburg **Boston** **Charlotte**

The "National" Booth System—

Here are the four units that solve your marking problems



No. 1

The National Metal Booth

arranged with the National Lang Counting and List Printing Machine and the No. 8 National Power Marking Machine.

No. 2

Improved No. 8 National Power Marking Machine

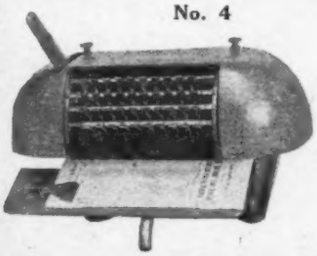
Marks all classes of laundry work.

No. 3

The Rose Label, Tape and Patch Sewing Machine

sews previously marked identification tags to garments that cannot, or should not, be marked direct.

No. 4



The National Lang Counting and List Printing Machine

Counts and lists in one operation.

Brings Real Efficiency to the Mill Village Laundry

The first principle of the mill village laundry is to save the 200 or 300 days' labor lost EACH WEEK when the mill workers remain at home to do their family washing.

The National Booth System

Will Bring Real Efficiency Into the Mill Village Laundry

Employees are less prone to bring their family work to the mill village laundry when they have no assurance that every article will be returned.

Mark Every Article Legibly, Correctly, And Indelibly With Improved National Marking Machines—and You Take the First Step Towards Eliminating Lost Articles

Separate the markers by using National Metal Booths. Eliminate the confusion in the marking department. Handle all work with the minimum number of movements, with but ONE HANDLING of each piece, and no cross-overs. Write today for the illustrated literature that tells in detail the advantages of the National Booth System for Mill Village Laundries.

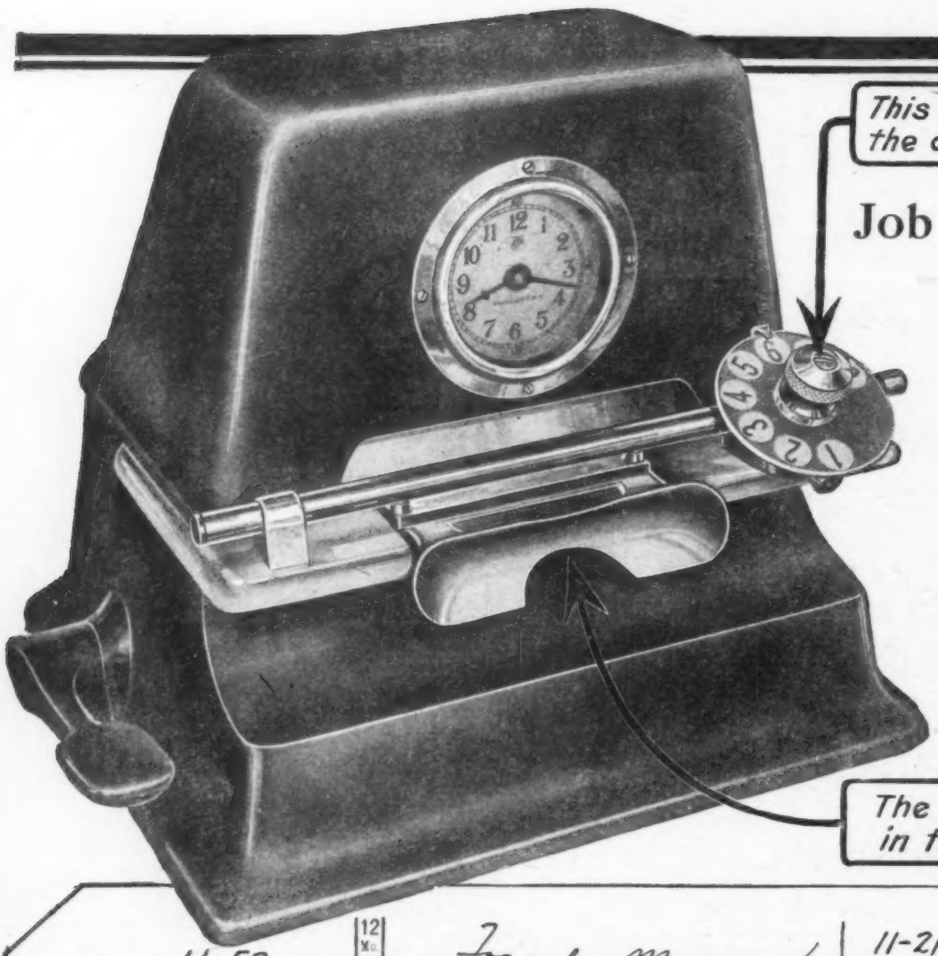
Address TEXTILE Department

The National Marking Machine Co.

General Offices

1068 Gilbert Ave. **Cincinnati, Ohio**

New York Office: 40-44 West Fourth St., New York City.
Boston Office: 100 Boylston St., Room 722, Colonial Bldg.
Chicago Office: 6 East Lake St., Suite 300.
Kansas City, Mo., Office: 500 Delaware St.



Job Time Records

The only way to obtain economical accuracy, is to make its attainment simple, easy, quick and sure. That is what has been done in this International Job Time Recorder for Recording Job Time.

Any form of job card can be used with this International Job Time Recorder, and the printing is so spaced as to make it particularly adaptable to the use of the Hollerith Tabulating Card.

EMPLOYEE NO. 1450
ORDER NO. 16980
PART NO. 1786
OPERATION 12
FINISHED NOV 21 4.7
STARTED NOV 21 1.2
PIECES GOOD 54
HOURS 3.5
RATE .55
AMOUNT $1.9
SIGNED J.B.m.

12 Mo. Name Frank Morgan Date 11-21-19 Dept. 14

Day	Yr	Employee No.	Dept.	Order No.	Part No.	Oper	Pieces Good	Hours	Earnings
10	0 0	20	0 0 0	0 0	0 0 0 0	0 0 0 0	0 0		
1	1	21	1 1 1	1					

NO. 42 NAME Charles Williams DEPT. NO. 3

	TIME RECORD	ELAPSED TIME		ORDER NO.	DESCRIPTION OF WORK
8	1919 NOV 21 5.0	1.5	Finish	2681	Gear cutting
7	1919 NOV 21 3.5		Start		
6	1919 NOV 21 3.5	3.4	Finish	2371	Grinding
5	1919 NOV 21 11.1		Start		
4	1919 NOV 21 11.1	1.9	Finish	3168	Milling
3	1919 NOV 21 9.2		Start		
2	1919 NOV 21 9.2	1.7	Finish	3351	Gear cutting
1	1919 NOV 21 7.5		Start		

TOTAL E. T. 8.5 RATE .60 COST $5.10 APPROVED J.W.B.

Write us for details on the special advantages of the International Job Time Recorder. You will have our prompt and practical cooperation.

INTERNATIONAL TIME RECORDING COMPANY, of New York

Works: Endicott, N. Y. Toronto, Ontario, Canada

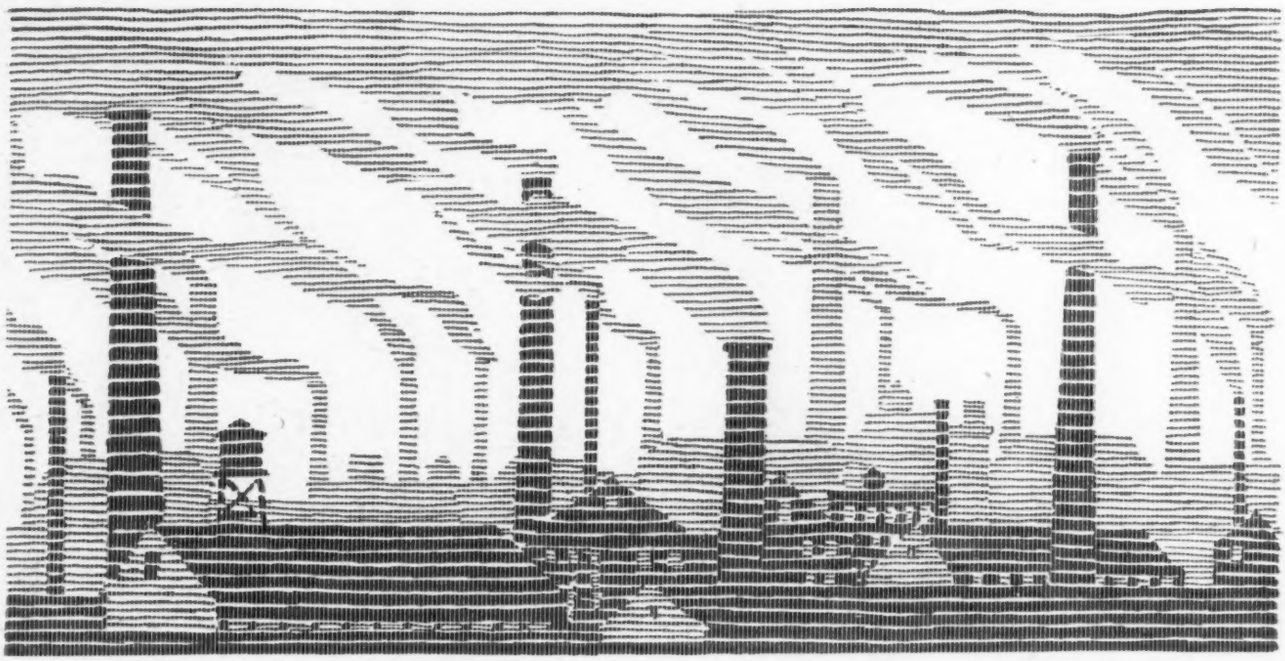
Offices and Service Stations in all principal cities of the world

General Offices: 50 Broad Street New York

Canadian Office: International Business Machines Co., Ltd. 300 Campbell Avenue, Toronto, Canada

London Office: 57 City Road, Finsbury London, E. C., England

Paris Office: 77 Avenue de la Republique Paris, France



The Figuring Behind the Walls of Your Mill

The answer to all your figuring problems is found in a Monroe Calculating Machine

BEHIND the walls of your mill are volumes of figures. Every step of manufacturing, of buying, of selling—in short, every step of business has its quota of figuring.

Whether it is adding or multiplying, dividing or subtracting—what you want is the answer—easily, accurately and quickly.

Cloth calculations, loom layouts, shrinkage, are just a few instances where a Monroe can save you time, labor and expense. Extending invoices, figuring payrolls, footing ledgers, finding costs, computing interest, figuring chain discounts—every figure job in your office can be solved in *seconds* on a Monroe Calculating Machine.

To add or multiply you turn the crank forward—and backward to divide or subtract. There on the proof dials is visual proof that your calculations are correct. Every step of the figure-work is checked.

Previous experience is unnecessary—so are trained operators. A few minutes is all the time needed for anyone in your office to become acquainted with the simple Monroe principle.

Simply send along the coupon for "BOOK OF FACTS" or a demonstration in your office. No cost—No Obligation.

MONROE

Calculating Machine

Not only Adds, but Multiplies, Divides and Subtracts as easily as other machines Add

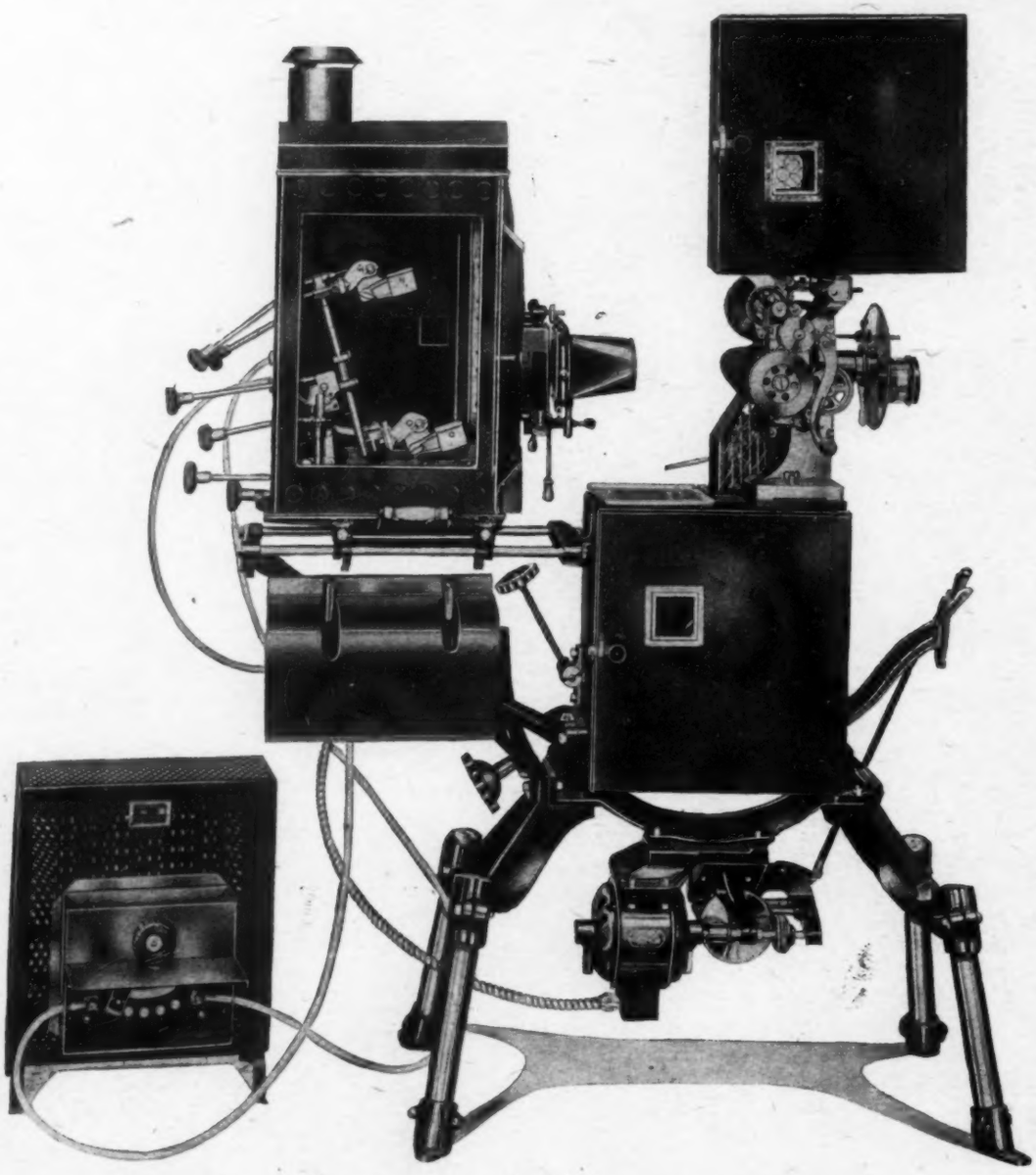
Monroe Calculating Machine Company
Woolworth Bldg., New York, N. Y.
Offices in Principal Cities

The "SHOW ME" Coupon—Mail it today

Monroe Calculating Machine Co., Woolworth Bldg., New York.
Without obligation to us, please send your "Book of Facts," showing how the Monroe will save time in the figure-work of our business.

Firm Name.....
Your Name.....
Address.....

Cotton 2-21



POWER'S MOTION PICTURE PROTECTOR

MEANS—

"HIGH CLASS PROJECTION
LONG SERVICE
SIMPLICITY OF OPERATION"

Complete Motion Picture Theatre Equipment

Southern Theatre Equipment Co.

Atlanta, Ga. **Dallas, Tex.**

Its Weird cry gets instant Attention

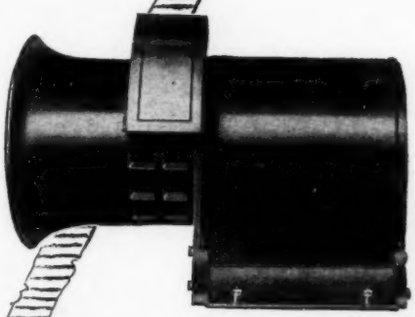
The weird, penetrating screech of the Federal Electric Siren rising from a rumbling groan to a piercing cry, gets instant attention of the men for whom it is intended. Whether used as a fire signal or as a calling signal in the factory or as a "start and stop" signal, it is never confused with any other signal.

It is heard loud and clear above the rumbling and roar of the machinery. Averages only $2.00 a year for electricity to operate—there is no other maintenance expense. Requires no expensive installation equipment—very easy to install as per our simple instructions.

Let us send you complete description and prices of the Federal Electric Siren—the better signal for less money. Mention for what purpose you would want it. No obligation.

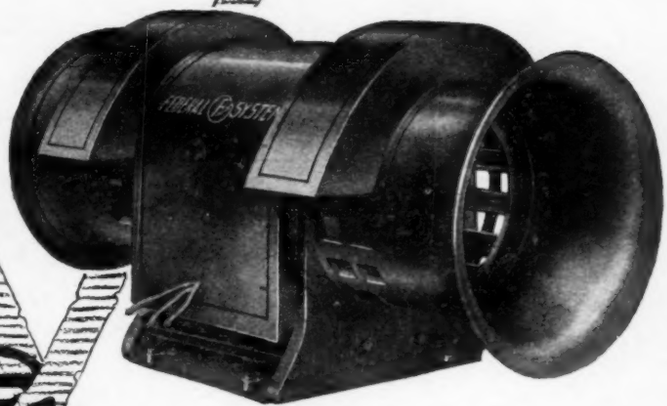
FEDERAL ELECTRIC COMPANY
representing
Federal Sign System (Electric)
Lake and Desplaines Streets, CHICAGO
91 New Montgomery St., SAN FRANCISCO
627-649 W. 43rd St., NEY YORK
Branches in All Large Cities
Send Coupon Today

"Type A" Call Signal.



"Type B" Single Head Call or Fire Signal.

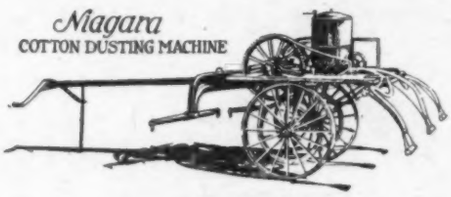
The real work regulator.



"Type B" Double Head Fire Signal.

The FEDERAL Electric Siren

Federal Electric Company *representing Federal Sign System (Electric)*
Lake and Desplaines Streets, Chicago, Ill.
Please send full information and prices of the Federal Electric Siren (for the Textile Mill)
Name ..... City .....
Street and No. ..... State .....
Company ..... Business .....
(Co 2)



You can raise COTTON *in spite* of

Boll Weevil

with the aid of

Niagara DUSTERS

and Niagara Diamond Brand Cotton Standard Calcium Arsenate

It has been definitely proven that the Coad System of controlling Boll Weevil by means of ***Powdered Calcium Arsenate*** applied to the plant in the form of a dust is a great commercial success.

The Department of Agriculture has pointed out that the success of the Coad System depends not alone on applying Calcium Arsenate in the right way, but also in using Calcium Arsenate of right strength and fineness.

Niagara Diamond Brand Calcium Arsenate is guaranteed to meet with the government specifications and the Improved Niagara cart type traction power duster is guaranteed to apply the dust properly. It has all the patented features that have for years made Niagara Dusters famous wherever fruit is grown. We also furnish an improved hand duster for use where the cart type is not practical.

Altho there is plenty of Calcium Arsenate there will not be enough dusting machines to supply the demand, so don't order materials without the Duster. Act quickly. Write for information today—ORDER NOW.

During the dusting season we will operate a FREE field service in charge of experts for owners of Niagara Machines. This service will cover the cotton belt and both take care of machines in field and give practical advice on all the details of Cotton Dusting.

Write Home Office or nearest distributor for catalogue and full information.

Niagara SPRAYER COMPANY

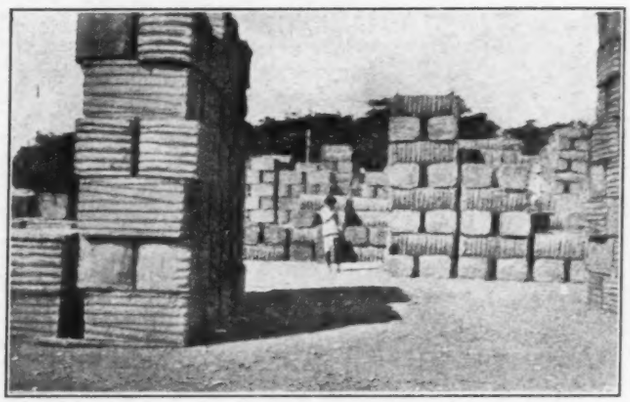
Home Office, 310 Main St., Middleport, N.Y.

Field Service Office, Vicksburg, Miss.

A Headquarters and Supply Depot in Every Cotton State

Southern Brokerage Co., Fort Valley, Ga.
Distributors State of Ga.

Are American Cotton Shippers Satisfied with this Exploited Contrast?



Indian Cotton Bales

American Cotton Bales

Uneconomic Wastefulness of America's Antiquated Baling Methods Being Advertised Overseas.

Foreign interests are exploiting the neat, compact bales of Indian, Egyptian and Chinese cotton to America's disadvantage. Above is reproduced one exploitation of the superiority of foreign over American bales. India, Egypt and China justifying Europe's complaint that the American bale is "the worst in the world!"

The Profitable Remedy for this Disgraceful Condition

If it were a matter of pride alone, everybody connected with the cotton industry in this country should continuously clamor for such improvement in America's baling methods as to bring them up to a par with the United States' otherwise warranted boast of progressiveness. But neat, compact, uniform bales are more than a source of pride in excelling the Orient,—correct baling is more profitable in every way. Correct baling is now made possible by the

Southwark Standard Compress

Produces uniform rectangular bales by recompressing gin bales, which, under present conditions, is the only practicable method for this country with 24,000 ginneries scattered over a total cotton area of 37,000,000 acres. These bales have a density of 32 to 36 lbs. per cubic foot—from hydraulic pressure of only 450 tons. They pack from 120 to 150 to the car, or about 50% more than the old style bales, thus greatly reducing freight charges. They are delivered overseas in perfect condition. After several years of successful operation, every element of uncertainty is eliminated in our latest improved compress. Operated economically by either electricity or steam.

Full Particulars Furnished Upon Request

Southwark Foundry and Machine Company

PHILADELPHIA, PA. **Branch Office at BIRMINGHAM, ALA.**

HIGH DENSITY COTTON BALING

56 lbs. PER CU. FT.

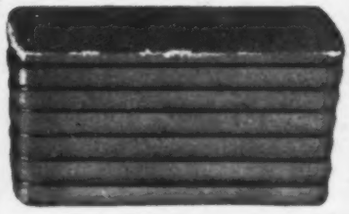
A Press That is Revolutionizing Cotton Baling

Cummins' New Patent "End-Press" Baling Press is the MODERN press. Its essential features consists of DENSITY and UNIFORMITY—absolute essentials to the rapid and economical transportation of cotton.

"It is conceded beyond question that American baling methods are the worst in the world," said the General Consul of London, in a report made in September, 1917.

The HIGH DENSITY of this Press produces a cotton bale 2½ times smaller than the present average cotton bale. This means economy in tonnage—a greatly lessened number of cars and ships to transport the staple, and a greatly improved quality of cotton.

Illustrated catalogue and full information on request.



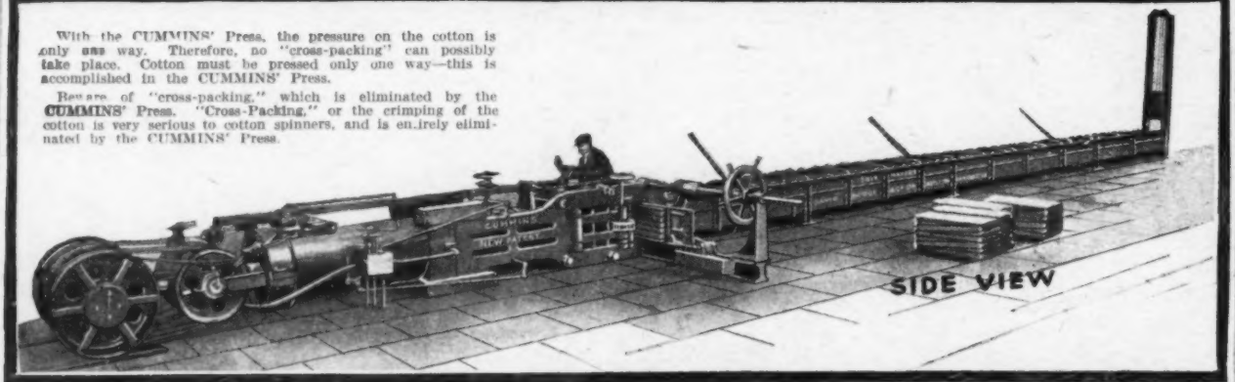
W.D. Crumpton, Inc.

American Representatives

29 Broadway *New York, N Y.*

With the CUMMINS' Press, the pressure on the cotton is only **one** way. Therefore, no "cross-packing" can possibly take place. Cotton must be pressed only one way—this is accomplished in the CUMMINS' Press.

Beware of "cross-packing," which is eliminated by the **CUMMINS'** Press. "Cross-Packing," or the crimping of the cotton is very serious to cotton spinners, and is entirely eliminated by the CUMMINS' Press.



DAVID BRIDGE & CO. LTD.

MANCHESTER, ENGLAND

From Expense to Profit

Why have two men do the work one can do? Cut your trucking costs in two. Install the McKinney One-Man Truck Service. Then send the old "helpers" into other departments. Make all your men producers.

By using the McKinney One-Man Truck one man can load, haul and unload heavy and bulky packages without a single stroke of assistance.

McKinney One-Man Trucks eliminate labor waste. A greater amount of work is done by half the number of men with less trouble and energy.

The McKinney way is the up-to-date way—the inexpensive way.

Look at the illustration to the right. Notice the steel arm reaching out and clasping the box. That does the work the extra man or helper used to do.

McKinney One-Man Trucks are perfectly balanced and are of light rugged construction. They are easily operated and are suitable for handling all kinds of merchandise under the hardest trucking conditions.

Do not overlook this modern way of reducing labor costs. McKinney One-Man Trucks will fit in perfectly with your needs—save you man-power and money. Send today for the illustrated booklet—"The One-Man Method."

Stock carried in leading cities.

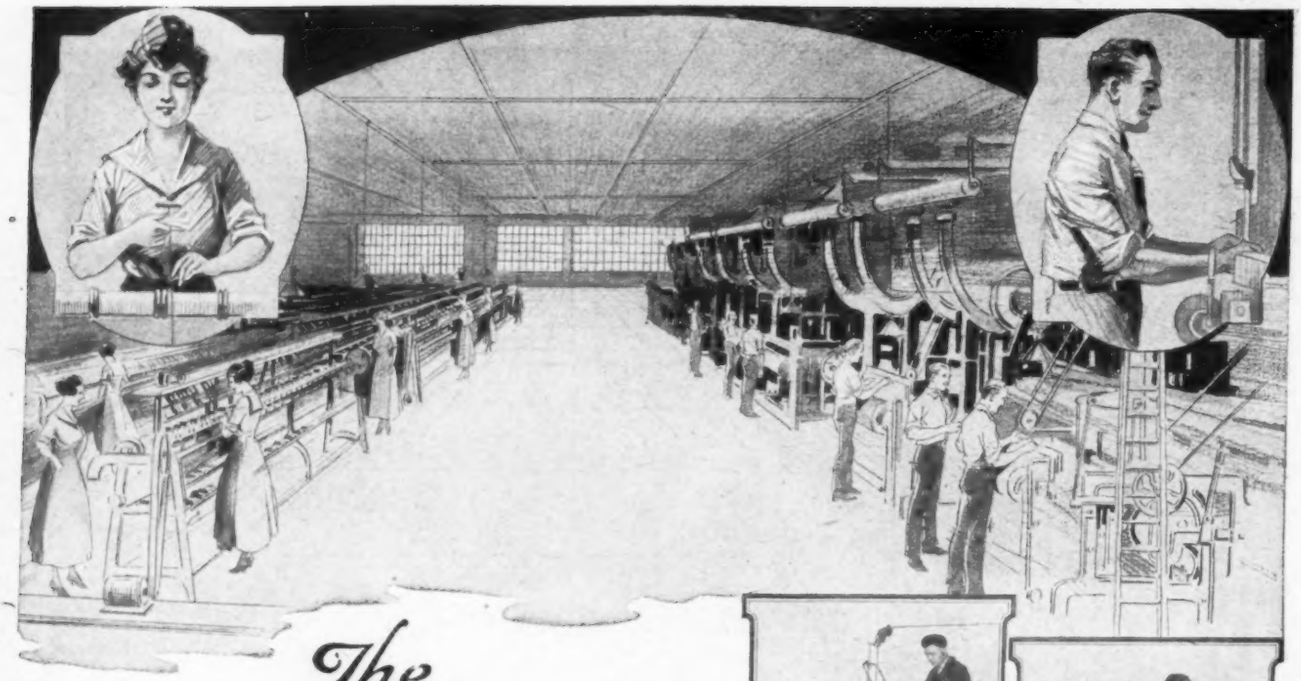
McKinney Manufacturing Co.
Pittsburgh
Western Office:—State-Lake Bldg., Chicago
Export Representation

THE LOVINGOOD CO.
Distributor, Atlanta, Ga.

Send for this illustrated booklet — "The One Man Method." It will tell you just the kind of truck you need for your business—the kind that will cut your trucking cost in two.

Also manufacturers of McKinney Hinges and Butts, garage and farm building door-hardware and furniture hardware.

McKINNEY *one-man* TRUCKS



The Magic of Cleanliness

A welcome transformation is going on in industry. On the magic carpet of cleanliness the workers are being carried into new and better relationships with employers.

Workrooms are being elevated to the same plane of attractiveness that has always drawn the best type of employees to offices.

The magic carpet carries no muddy-minded undesirables, but leaves them to the sordid world of dirt, discontent and disloyalty.

The Finnell System of Power Scrubbing is the force behind this magic. With results 100% clean, it encourages cleaner care of machines, cleaner workmanship, cleaner persons, cleaner minds, producing and maintaining all in all a higher type of worker.

Many concerns have already observed the magic influence. We are ready and willing to prove its power to you. A postcard request will bring you interesting facts.

Units in the Finnell System of Power Scrubbing

These units and others of various capacity permit the composition of complete outfits economically suited to any requirements.

American Scrubbing Equipment Co.

General Offices: 180 N. Wabash Ave., Chicago
Factories: Hannibal, Mo.

DISTRICT OFFICES

Atlanta	Buffalo	Denver	Los Angeles	Newark	Philadelphia	Salt Lake City
Baltimore	Chicago	Detroit	Louisville	New Orleans	Pittsburgh	San Francisco
Boston	Cincinnati	Indianapolis	Milwaukee	New York	Providence	Seattle
	Cleveland	Kansas City	Minneapolis	Omaha	St. Louis	

Which is the Cleanest Mill in America?

Whichever it is, wherever it is, there you will find a better class of workers—happy, contented, productive, well repaying the investment in the System that scrubs 100% clean.

100% CLEAN

FINNELL SYSTEM

OF POWER SCRUBBING

Handling Bales of Cotton
on
The Levee at New Orleans

From the fields of snow-white cotton-bolls down to its final use by the consumer, machinery has speeded up and improved methods in the Cotton Industry.

Electricity is the power that has contributed a goodly share in making cotton history. On the levee, Industrial Tractors and Trucks, powered with

Edison Storage Batteries

now replace hand truckers—speedily transferring bales of cotton from the warehouse to the ship's hold.

One truck or tractor does more work than five to ten darkies with hand trucks.

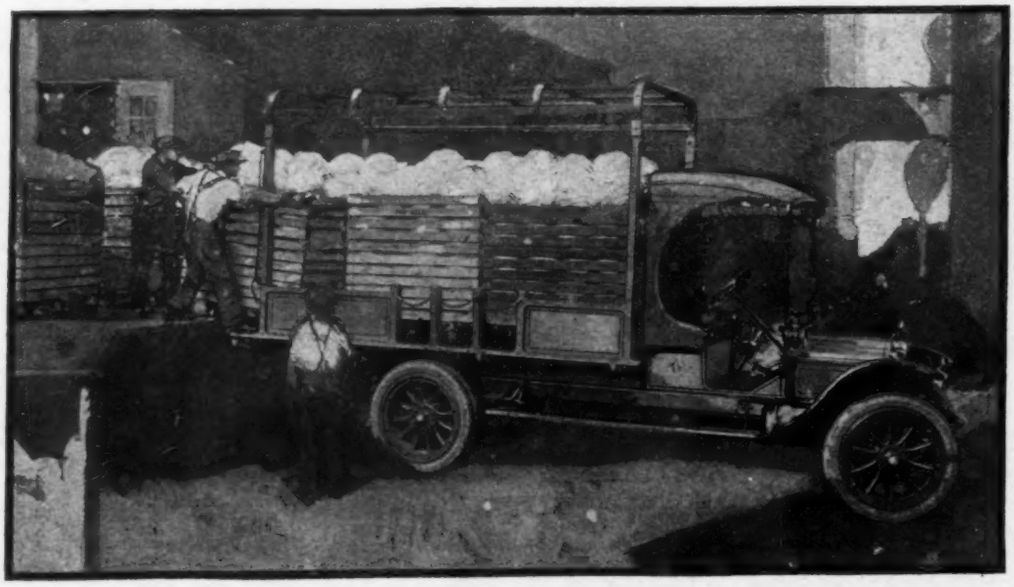
Edison Storage Batteries with their stel and iron construction guarantee dependable service, day in and day out, at lowest maintenance cost.

Let us show you why Edison equipped Trucks and Tractors are proving wise investments in the Cotton Industry. Write—today—for Bulletin 600-AD.

Edison Storage Battery Company
Factory and Main Office, Orange, N. J.

DISTRIBUTORS IN

New York Boston Chicago Cleveland Detroit Seattle San Francisco Denver Los Angeles Kansas City New Orleans Atlanta Washington Pittsburgh Scranton Philadelphia Syracuse New Haven.



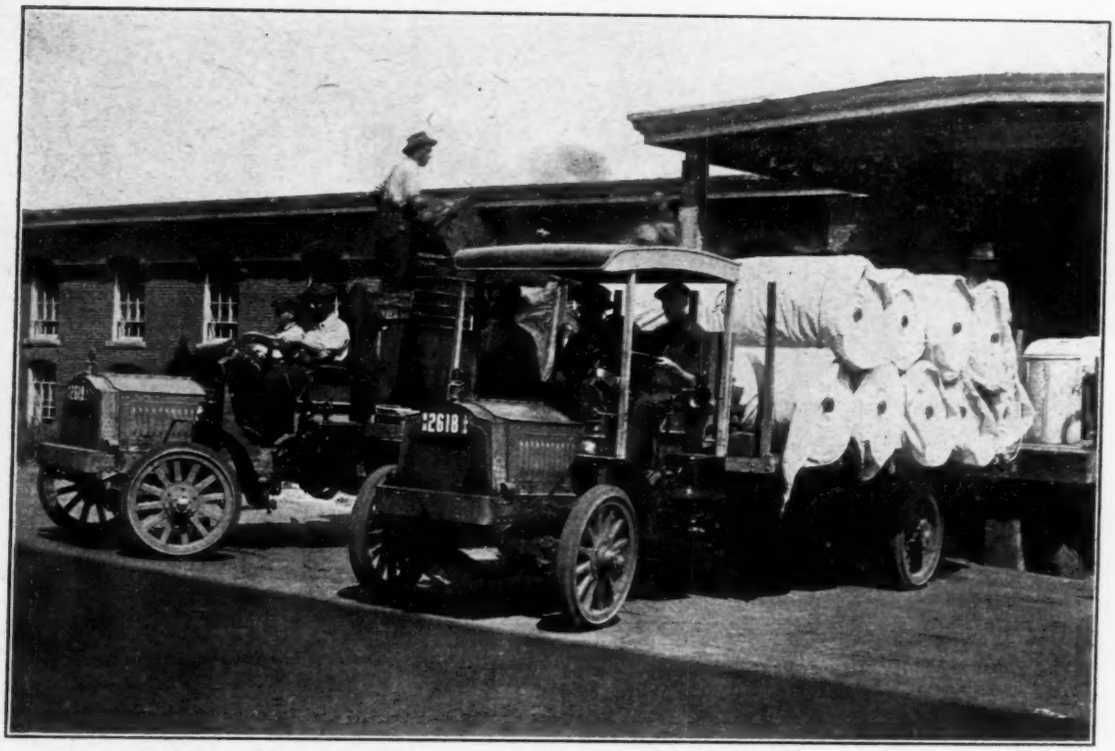
Leadership

THE steady, substantial growth of White output year by year is a constant proof of the unequalled *performance* of White Trucks. Each year White output leads the industry in number and value of high grade trucks produced.

Everywhere White Trucks are known for their high earning power, for their ability to do *the most work for the least money.* That is the test of truck merit and the firm foundation of White leadership.

THE WHITE COMPANY, *Cleveland*

WHITE TRUCKS



This truck handles tons of cotton cloth daily between a New England factory and the freight station

Average Day's Haul 140 Miles in 11 Hours

PROMPT deliveries are so important to the textile manufacturer that he is depending more and more on his motor trucks for distances up to 100 miles.

One Packard Truck, as reported by the National Standard Truck Cost System, hauls an average of 7 tons per trip between Holyoke, Massachusetts, and New York City. In ten months' time this Packard was only laid up two days for repairs.

Such a record is only possible with a truck having the uniform quality of the Packard.

THE Packard Company controls the building of its trucks from the ground up. It has not hesitated to use costly methods *where such methods would add to the strength of the truck and lengthen its working life.*

Packard owns and operates the most extensive heat-treating and finishing plant in the world—producing a steel that is stronger than the average by 35,000 to 62,000 pounds to the square inch.

Each run of steel is tested to the final limit of strength. Each finished part to the highest known standard of accuracy.

The Textile Manufacturer who has suffered from the uncertainty of railroad deliveries will be interested in the sureness of Packard Truck Transportation.

"Ask the Man Who Owns One"

PACKARD MOTOR CAR COMPANY, *Detroit*

ELECTRIC INDUSTRIAL TRUCKS

INDUSTRIAL TRUCK CO. ITC HOLYOKE, MASS.

DELIVER THE GOODS

THE ITC Electric Load Carrying Truck is a strong, compact machine, designed for heavy mill trucking. It should be a part of the regular equipment of every cotton mill. For quick and efficient handling, or loading of raw stock or finished goods, the ITC Storage Battery Truck will accomplish the work of a score of men.

THE ITC is a tremendous time, expense and labor saver. It keeps everything moving smoothly and quickly. Its compactness, small turning radius and perfect control make operating simple and safe. The vital necessity of speeding up the movement of baled or crated goods has proven hand trucking methods inadequate.

ASK FOR I-T-C BULLETINS
THEY DESCRIBE VARIOUS TYPES

INDUSTRIAL TRUCK COMPANY

Div. of COWAN TRUCK CO., 107 CANAL ST.
HOLYOKE, MASS.

OUR SOUTHERN REPRESENTATIVES ARE:

The Lovingood Co.,
406 Peters Bldg.,
Atlanta, Ga.

F. J. Gauntlett,
Wilkins Bldg.,
Washington, D. C.

3 TYPES:
TRACTORS,
ELEVATING
and
LOAD CARRYING

White Hickory Motor Trucks

Score an unusual record for downright, steadygoing service with lowest possible upkeep and operating costs, in the cotton states. Built of standard parts, selected for known strength and maximum service. Continental Red Seal Motor, Eisemann High Tension Magnetos, Timken Axles, worm drive, and every other—even the most minor—part in keeping with the integrity and purpose of the men who **must** build to sustain 40 years' leadership in the production of sturdy transportation vehicles.

Wherever hauling conditions are severest—wherever deliveries **must** be made regardless of any consideration **except getting there on time**—wherever repair and upkeep bills are subjected to the most exacting scrutiny, White Hickory Motor Trucks win unstinted approval.

Fickett Manufacturing Co., of Atlanta, writes:

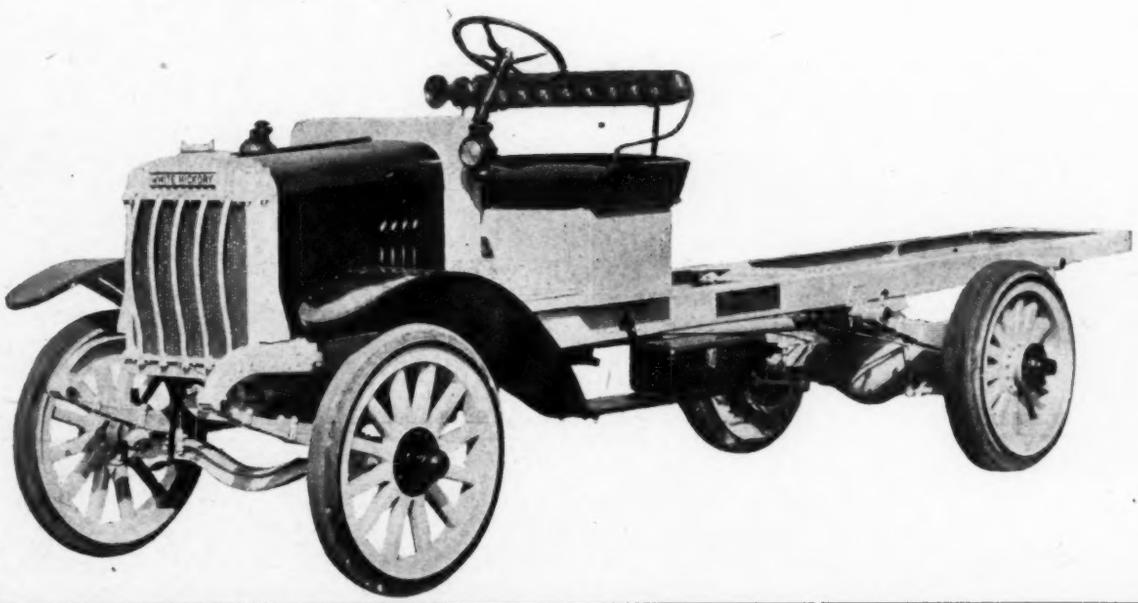
"Our White Hickory Motor Truck has been in operation about nine months and we have had no up-keep charges or repair bills other than one caused by the driver carelessly running into a post.

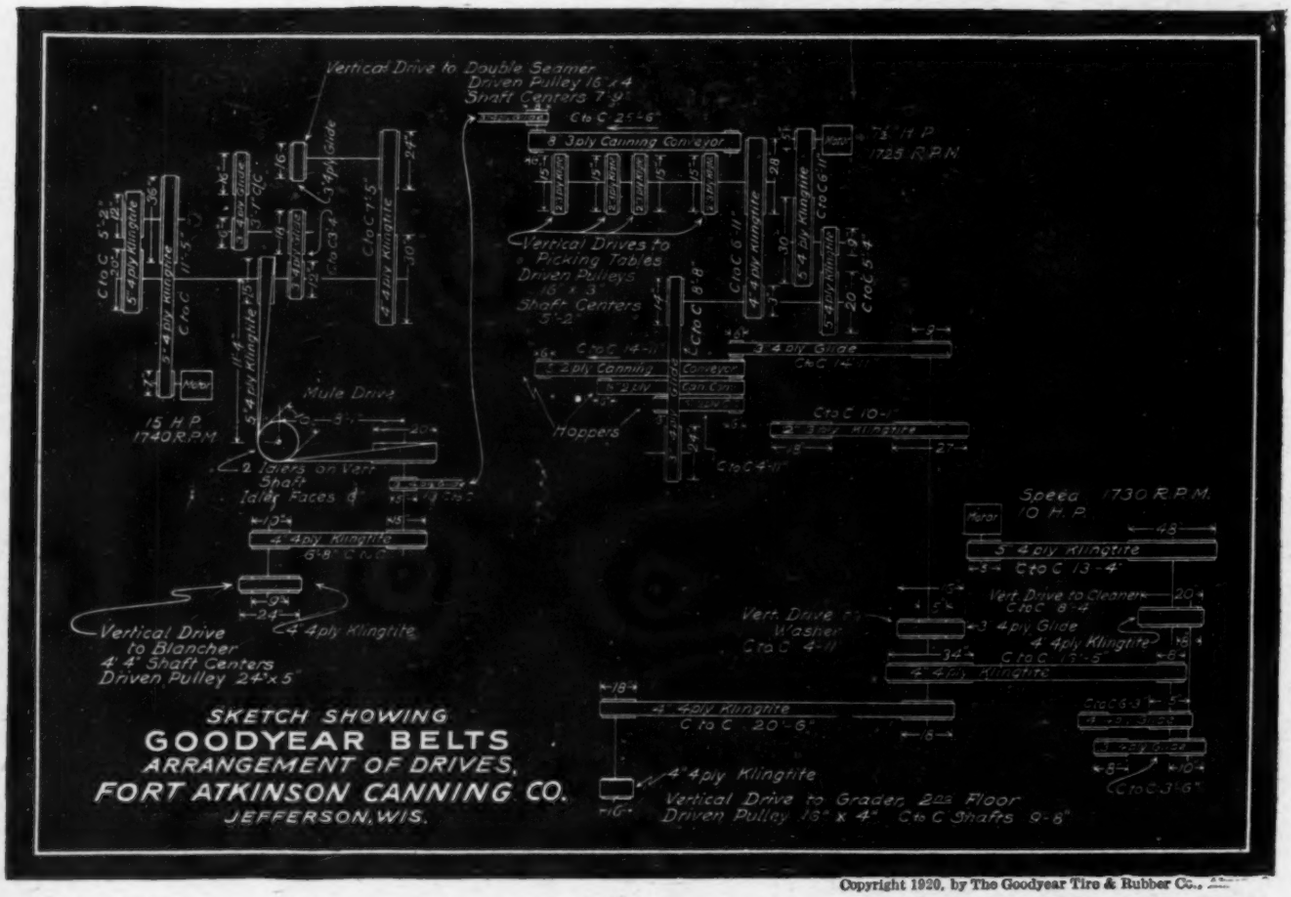
"We formerly used a truck of another make which we disposed of on account of the high up-keep, and we find your truck more satisfactory and economical in every way."

Immediate deliveries. Repair parts—if needed—quickly supplied by our Atlanta factory.

We will welcome an opportunity to send you our literature.

White Hickory Motor Corporation
Atlanta, Georgia.





Copyright 1920, by The Goodyear Tire & Rubber Co., Inc.

An Idea, Our Good Name—and the G. T. M.

They had never used a Goodyear Belt. But the Fort Atkinson Canning Company did know Goodyear reputation for quality—knew it by the willing testimony and the demonstrated experience of other concerns the country over who were reporting notable successes with Goodyear Belts on every kind and condition of drive.

And the plant analysis idea proposed by the G. T. M.—Goodyear Technical Man—struck them as the logical way to insure the right belt for every duty. They had opportunity to test the principle of it thoroughly in a study of their new plant's belting requirements. They had the G. T. M. make the study.

So they specified 100% Goodyear equipment—transmission belts, conveyor belts, steam hose, water hose—for their new cannery at Jefferson, Wis., all on the basis of the G. T. M.'s plant analysis and their confidence in Goodyear products.

The Jefferson plant is an efficient linking of different transmissions and conveyors. No one type of belt, however well adapted to one form of duty, could be depended on to fulfill with equal capacity all these varied demands.

Note the belts specified to their particular uses: for the light drives, where the conditions are small pulleys run at high speed and uniform load, Goodyear Glides; for general transmission and moderately heavy duty, Goodyear Klingtite has been used. Width, plies and type are specified to the service required. The belt on the canning conveyor, due to its particular construction of cover, fabric and friction, insures against the action of acids in the raw material carried.

The unfailing performance of these Goodyear Belts substantiates the plant analysis method of applying belts to the specific service. Their freedom from belt troubles—no slipping, no stretching to an appreciable amount, which usually causes an interruption in production in order to "cut out" and take up the slack—is their own best service assurance.

Both Goodyear analysis and Goodyear Belts are at your service. The G. T. M.'s expert study of either a single drive or a complete plant installation is without obligation on your part. For further information about the Goodyear plan of plant analysis and the G T. M., write to the Mechanical Goods Dept. of The Goodyear Tire & Rubber Co., Akron, Ohio.

BELTING · PACKING · HOSE · VALVES

GOODYEAR

Ladew

36 Years of Service

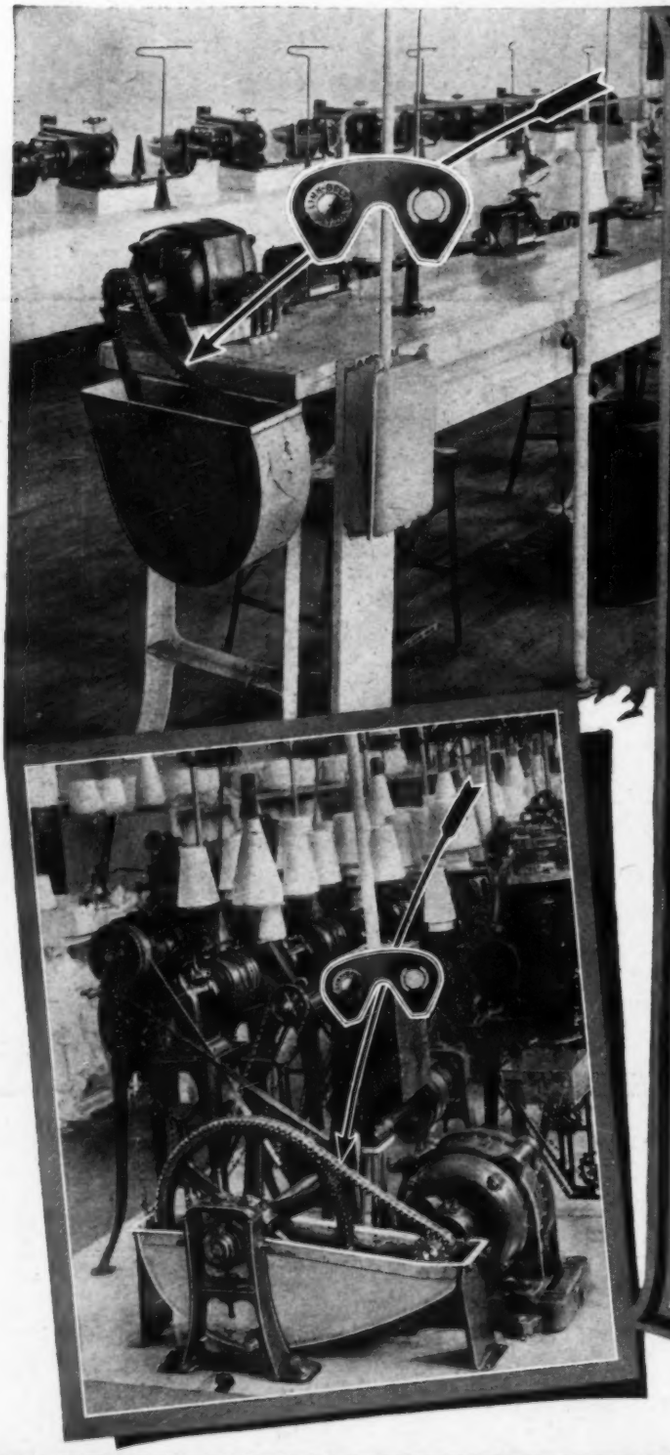
That's what the Ladew belt pictured above has given—running at high speed on a quarter turn drive. And the engineer in charge says it is still in good condition—equal to many more years of hard work. Here's a typical example of the stand-up-ability of Ladew Leather Belting—the kind of service you can expect when you let Ladew engineers help you apply the right Ladew Belt for your purpose. It costs nothing to learn more about belt engineering. Ask us.

EDW. R. LADEW CO., INC.
GLEN COVE, NEW YORK, U.S.A.

Since 1835

Branches and distributors in all principal cities of the world carry complete stocks.

AP-38



Another Indorsement for Silent Chain Drives

MR. J. E. Sirrine, one of America's foremost textile mill designers and production engineers, as a result of his research work, declares in a recent address:—

"In no case have we ever known a mill that failed to get increased production, where individual drives were installed. In applying individual motors to looms, we find we are not only getting a higher production but a better cloth, due to the fact that the speed is constant, and the cloth looses that wavy appearance, due to unequal beat-up of the filling threads. Altogether, we are thoroughly convinced that one of the ways of increasing production, is securing uniform speed, either with Silent Chains, direct connected motors, or by gears. I think **we get better results with silent chain than with any other form of drive".**

Think over these statements and send for one of our experienced engineers to study your conditions, and explain the results of various tests which have proved the superiority of Link-Belt Silent Chain. It is the ultimate drive for textile machinery.

LINK-BELT COMPANY

PHILADELPHIA CHICAGO INDIANAPOLIS

New York	299 Broadway	Boston	49 Federal St.
Pittsburgh	1801 Park Bldg.	St. Louis	Central Nat'l Bank Bldg.
Buffalo	547 Ellicott Square	Wilkes-Barre	20 Nat'l Bank Bldg.
Huntington, W. Va.			Robson & Prichard Bldg.
Cleveland			429 Rockefeller Bldg.
Detroit			932 Dime Bank Bldg.
Minneapolis			418 S. Third St.
Kansas City, Mo.			306 Elmhurst Bldg.
Seattle			576 First Avenue, S.
Portland, Ore.			First and Stark Sts.
San Francisco			582 Market St.
Los Angeles			163 N. Los Angeles St.
Toronto, Can.			Canadian Link-Belt Co., Ltd.
Denver			Lindrooth, Shubart & Co.
Louisville, Ky			Fred'k Wehle, Starks Bldg.
New Orleans			C. O. Hins, Hibernia Bk Bldg.
Birmingham, Ala.		S. L. Morrow	720 Brown-Marx Bldg.
Charlotte, N. C.		J. S. Cothran	Com'l Bank Bldg.

386

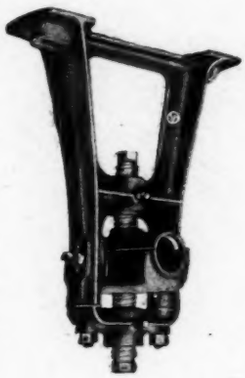
We Also Make

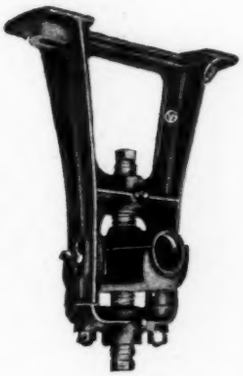
- ☐ Elevators and Conveyors
- ☐ Link-Belt and Sprockets
- ☐ Truck and Tractor Chains
- ☐ Electric Hoists
- ☐ Portable Loaders
- ☐ Coal and Ashes Systems
- ☐ Coal Pockets
- ☐ Complete Sand and Gravel Plants

Write for Catalogs
Place X in Square

LINK-BELT
SILENT CHAIN DRIVES

VALLEY
POWER TRANSMISSION APPLIANCES



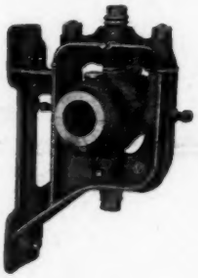


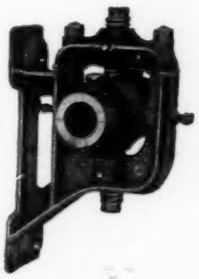
Years of painstaking experiment have produced the "Valleiron" line of transmission appliances. Years of huge sales by dealers have made them popular. Sixty years of superior service have made them famous.

For over half a century the Valley Iron Works has supplied the best trade in America. During all that time "Valleiron" Products have never failed to give complete satisfaction under the severest tests.

Our Engineering Staff is at your service at all times.

Our Power Transmission appliance catalogue will be sent you on request.





Established 1858

Valley Iron Works
WILLIAMSPORT PENNSYLVANIA

Your link between power and production

IF you are looking ahead toward production—big production—the kind of increase that the coming days will surely require, you need a belt that is going to stand the pull. You need a belt that is going to keep things humming in your plant without let-up; a belt that wants no repairs and will cause no delays despite endless usage; a belt that will save you time and money.

Cocheco Belting will more than answer these qualifications. Cocheco is taken from the center part of carefully selected butts—the most durable leather to be found. Every inch is pure oak tanned, curried by a special process and properly stretched and dried. 75 years' experience back the Cocheco quality. You'll find the saving power of this belt a revelation.

You want this belt, Mr. Modern Manager. Find out about it today. We'll be glad to send details.

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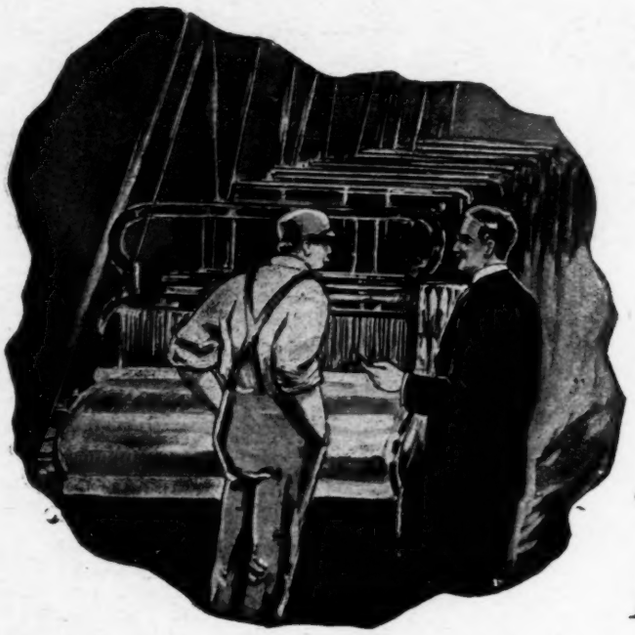

"Now Look Here Johnson

YOU can stop the spoilage from oil throwing off loom bearings by lubricating them with NON-FLUID OIL. It is very adhesive and has stopped the spattering of oil on spinning frames—it simply would not drip or throw off."

Wide-awake Superintendents are profiting by experience with NON-FLUID OIL in one department to try it out in others. They are finding that wherever used it puts a stop to the dripping of oil.

NON-FLUID OIL should be used on all kinds of textile machinery because it not only gives perfect lubrication but lessens oil bills, saves time in oiling and cuts down the usually heavy item of spoilage of goods due to oil stains.

There is a grade of NON-FLUID OIL exactly suited in each machine, in every department of a textile mill.

Write today for free testing samples giving the machine and bearing on which you wish to try it. We will also send a copy of the latest edition of "Lubrication of Textile Machinery."

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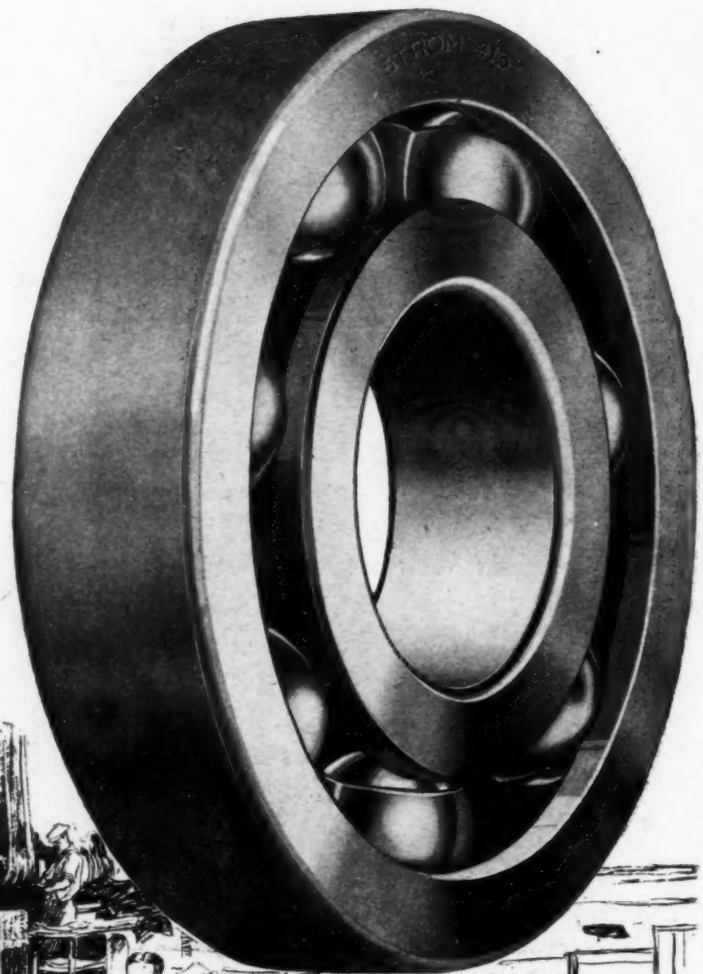
THOSE who have had most experience with bearing equipment are quickest to appreciate the unusually high quality of Strom Bearings. By dependable performance in many lines of industry they have proved their worth. The nation-wide demand for these bearings has steadily increased from the first.



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Good Oil is a most important factor

A constant stream of clean, cooling oil must be supplied to the bearings at all times.

The oil must not emulsify nor form deposits of any kind and must free itself from any moisture entering the system.

It must also maintain a uniform quality over long periods of time.

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A special product for a special purpose which meets,perfectly,turbine conditions

Texaco Regal Oil is only one of the many Texaco Lubricants made for special purposes.

There is a Texaco Lubricant for every mechanical appliance in the mill as well as in the power plant.

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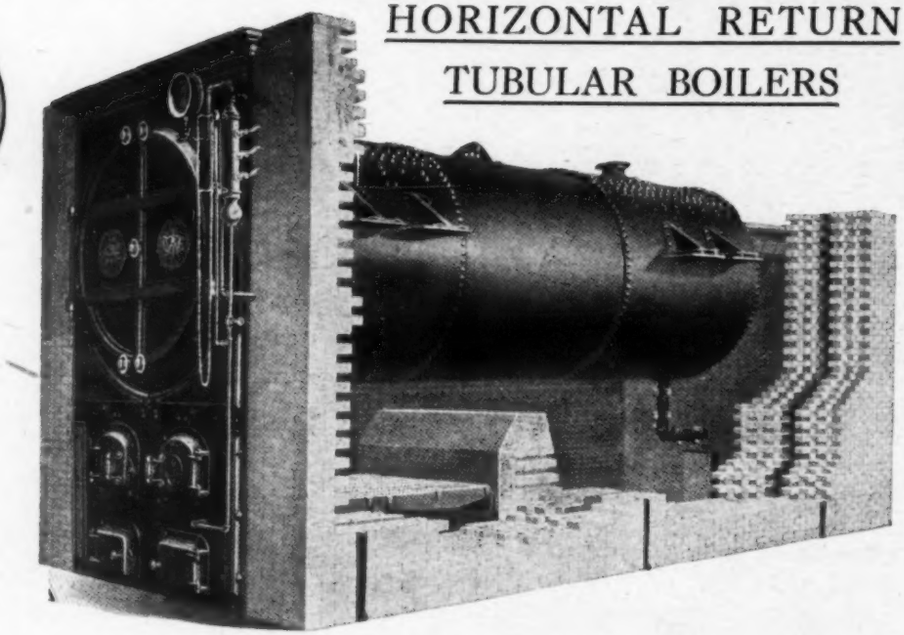
TUBULAR BOILERS



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The horizontal return tubular boiler has adapted itself so fully to the requirements of the rapidly increasing industries of this country that it has become the standard and most preferred type for factory and mill use.

There were some dissatisfactory features of older makes of this type of boiler, but in designing our make we have endeavored to embody only the most perfect features of other boilers and eliminate all the objectionable features.

The result is a PERFECT Return Tubular Boiler that as to safety is fully in accordance with the very strict requirements of the Massachusetts Board of Boiler Rules and ASME Code, and as to economy in operation and low up-keep cost is not surpassed by any other boiler on the market.

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Every boiler that leaves our shops is thoroughly tested and under our rigid inspection you are assured of getting a perfect unit, mechanically as well as in design.

Write today for full information.

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Southern Representative: Isaac Hardeman, Charlotte, N. C.

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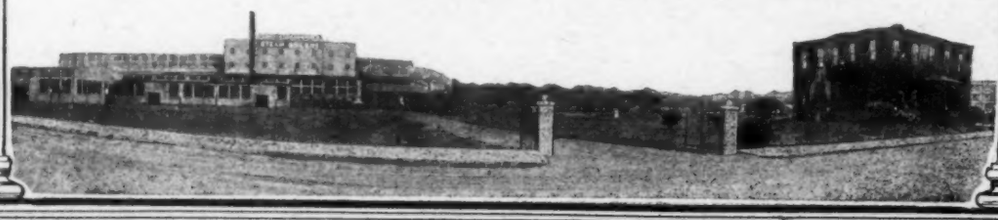

A Typical Installation of "Permutit" Water Softeners in the Textile Mill

Do You Know What Your "Hard Water Costs" Are?

They're on your books—though they may not appear as distinct items of cost. They take the form of added expenses and lost values.

Here are the added expenses:—excessive quantities of soaps and dyes; needlessly high fuel consumption; labor wastefully applied in defective processes.

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Permutit
TRADE MARK
Water Rectification Systems

WILL ELIMINATE THEM

How? By making your present water supply—no matter how hard it may be—absolutely soft, absolutely free from everything that will impair your processes.

That "Permutit" will do this—is doing it—is a matter of record in hundreds of textile plants, the country over.

"Permutit" performance in these plants is the best of evidence of the economies you may expect to realize when your plant is "Permutit" equipped.

Address our nearest office, where a "Permutit" engineer is ready to give you a concrete proposition based upon your particular conditions.

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Aladdin

Roanoke Mills Co. Consult Aladdin Instead of Doctor

Besides a costly labor turnover, causing a lessening of production the Roanoke Mills Co. had a health problem to solve. Instead of calling in a doctor the Aladdin Company was consulted. After going into the proposition thoroughly an order for 50 Aladdin Houses was placed. Within a few weeks construction work had started. Before all the fifty houses had been erected another order for more Aladdin Homes was placed. Nearly a hundred Aladdin Houses have been erected by this one concern. The saving in time and waste of materials was recognized. And since the housing conditions have been improved, health conditions in the Roanoke community have been bettered nearly one hundred per cent.

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The Aladdin System of Construction saves 18 per cent of the lumber wasted in ordinary building. Standardization and quantity production further reduce the building cost approximately 30% to you. Also you benefit by Aladdin's stupendous purchasing power. Aladdin houses are easily and quickly erected by unskilled labor. Simple, complete instructions are furnished with each house.

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Aladdin houses are Readi-cut. Every piece of joists, studs, rafters, sheathing, siding, flooring, interior finish is cut to proper size, marked and numbered ready to nail in place. Sufficient material to complete more than 3000 houses is carried constantly in stock ready for instant shipment. Depending upon size of house, we load from one to three complete houses in each car.

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Aladdin houses are manufactured and shipped direct from the Aladdin Company's own mills in Michigan, North Carolina, Oregon, Mississippi and Canada. Aladdin houses come to you in a straight line from the nearest timber region. Aladdin's Industrial Homebuilding Service means shorter routes, quicker delivery and lower freight rates for builders in every part of the United States. Three days to a week are saved in shipments reaching destination. Complete Sales and Business Offices are maintained in connection with each mill. Fully 24 hours' time is saved in your mail reaching our offices.

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The Aladdin Co.

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Industrial Housing

More Goods-Production

is the urge of the textile manufacturer.

There is an economical limit to the capacity of the machinery. As often as otherwise this limit is not reached.

Production, however, depends on many other factors besides machines—on such apparent minor points as temperature, light, humidity, ventilation, sanitation.

This last item, for instance—the lost time through preventable ill health of operatives is at all times a problem of grave importance to the profit of a textile mill.

Proper sanitation and housing conditions are means to stability of employment and a minimum labor turnover.

The solution of these production problems are engineering tasks.

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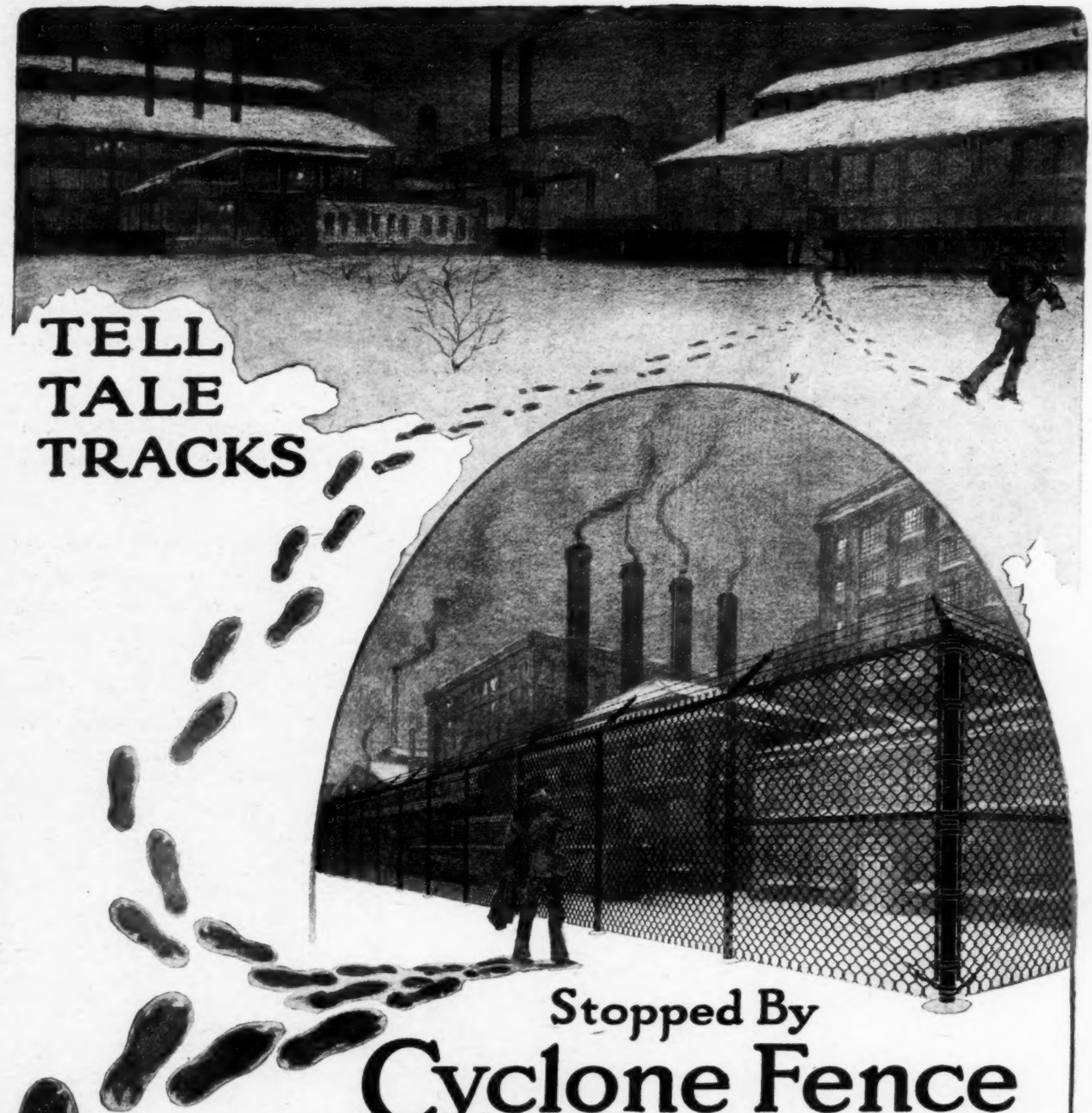

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For
Economy

"Today —— the Sash makes the Factory"

HAVE you looked up the price of Lupton Steel Factory Sash for that new building you are planning?

You know, of course, the advantages of steel sash over wood—its longer life, freedom from warping and sticking, more abundant lighting and easier operation of ventilators. And you know that, with the high wages of today, ventilation and light are more important than ever before.

But did you know that Lupton Steel Factory Sash is an economical "buy" even from the standpoint of first cost?

Lupton Steel Factory Sash can readily be erected in buildings of wood, mill construction, concrete or steel. Our Catalogue 10-LSS gives full details. Shall we send a copy?

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Pond Continuous Sash
for Pond Truss roofs, monitors, sawtooths, and side walls
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for long lines of sash

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DIVIDE the definite quantity of steel available for bars into an excessive number of sizes (as is now done) and you can never be sure of quick delivery on quantities of **any particular size.**

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Pee Gee Factrilite, The Liquid Daylight, has successfully solved the problem of real paint economy.
This 100 Point Mill White helps to utilize every ray of light that enters your mill, thereby increasing the working hours by daylight and decreasing the use of artificial light.

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For Interior Walls and Ceilings of Mills

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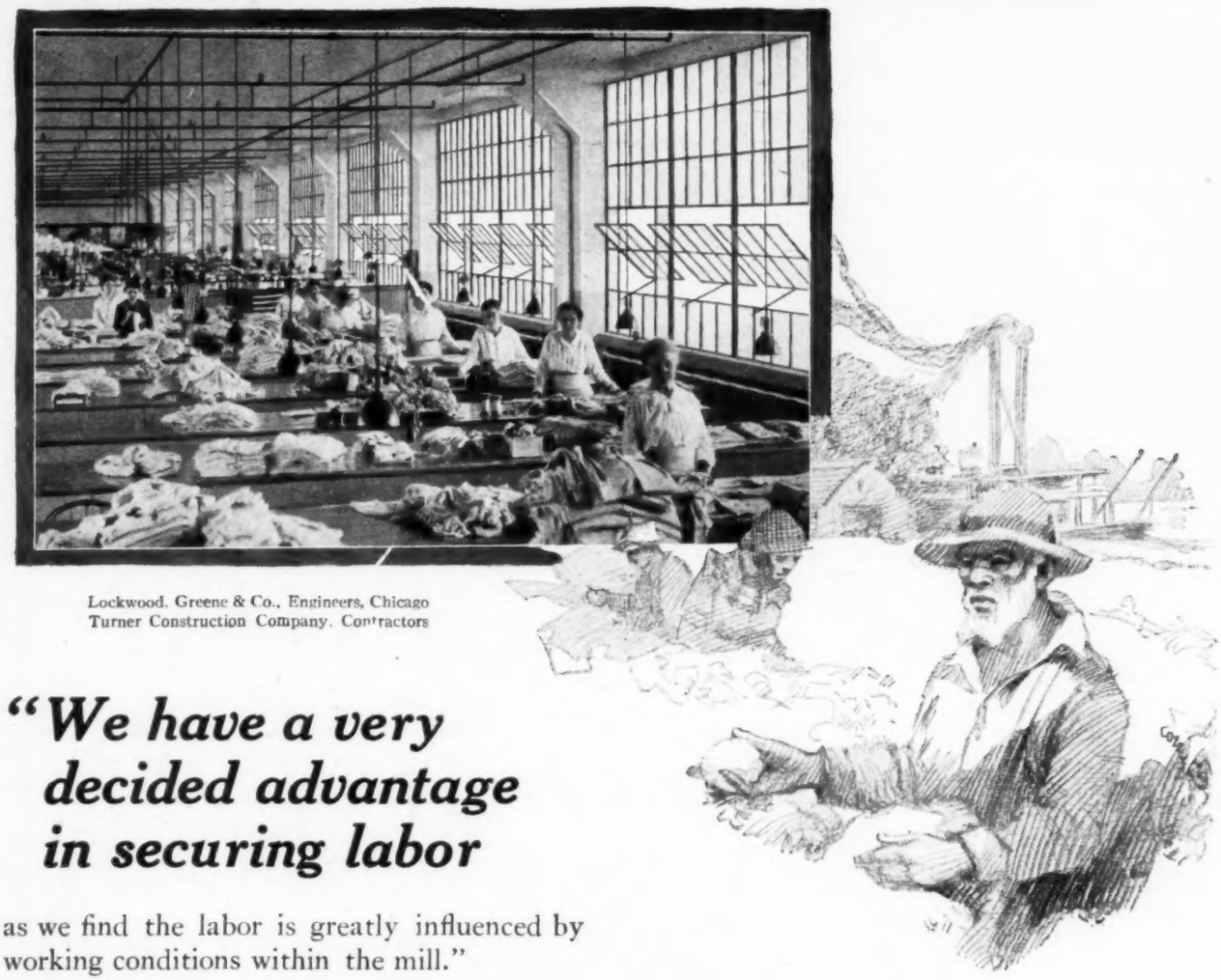

Lockwood, Greene & Co., Engineers, Chicago
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"We have a very decided advantage in securing labor

as we find the labor is greatly influenced by working conditions within the mill."

This is the experience of JOHN T. BRINE, General Superintendent of the Black Cat Textiles Company, referring to the Fenestra Window Walls in the Bennington, Vt., plant shown above.

"We find that through the use of Fenestra we are able to secure much more light and at the same time more perfect ventilation. In fact we feel that working conditions are greatly improved, and since the erection of our new plant we have a very decided advantage in securing labor over our competitors.

We are more than pleased with the results that we have been able to secure through their use."

Fenestra Window Walls of shining glass and steel bars are the most economical of wall materials, because they make light cost less and produce more.

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The Vortex Painter Handles a Stiff Job!

The Vortex Painter

The Vortex Painter has clearly demonstrated its unusual value on out-of-the-way and out-of-the-ordinary jobs.

On the water-storage tank shown, at the Willys-Overland Service Station in Cleveland, one man with helper covered sides and roof—approximately 3500 square feet—in a high wind, in 3½ hours' time. No scaffolding was required. The tank was painted with Vorcolastic Royal Red.

Practically the entire interior of this Willys-Overland Service Station was also done with the Vortex Painter and Vorco Paints.

Another unusual job at the same plant was the painting of a long wire-mesh fence with the Vortex Mechanical Painter.

Send for a list of time-saving records made with the Vortex Painter and Vorco Quality Paints.

There is a reliable painting contractor in your locality who will be glad to use the Vortex Painter on your work, or we are prepared to send you this equipment with full instructions for its use.

VORCO BRANDS

The

VORTEX

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A Safe, Reliable Guide to Correct Industrial Lighting

Good lighting is a factor of first consideration in any effort to increase production, improve workmanship, reduce spoilage and safeguard employees.

This book contains practical information and complete data for applying the principles laid down by illuminating engineers as the best practice in the lighting of buildings and areas devoted to industrial uses.

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In your future purchases of enclosed fuses be sure to insist that both the fuses and the renewal links, IN ALL CAPACITIES, bear the inspection symbol.
ECONOMY "Drop Out" Renewal Links made approval possible for renewal Fuses.
Millions in use for many years.
Ask for and insist upon ECONOMY renewable FUSES and the famous Economy "Drop Out" Renewal Links.

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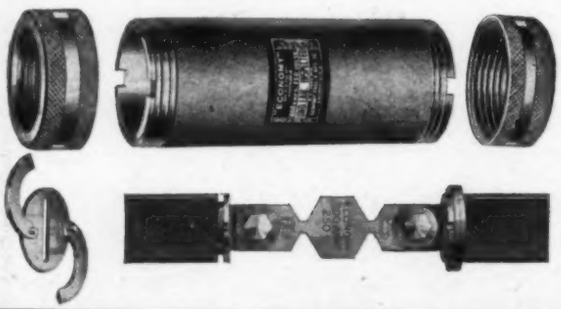

THE IMPROVED ECONOMY RENEWABLE FUSE

Study the renewal link feature. See the two narrow bridges of metal holding the "Drop Out" features in place. In operation on short circuits, these two bridges fuse. The entire fuse metal does not volatilize, only the two narrow bridges. This very greatly decreases the danger factor due to the tremendous pressure generated when an entire strip of fusible metal is instantly converted into gases. No powdered filler to deteriorate or solidify. Only the fuse metal is destroyed; the fuse itself is ready for years of service. See the new winged washer which makes it simple and easy for anyone to replace the "Drop Out" Renewal Link in a few minutes.

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"Ivanhoe" Steel Reflectors, Lighting Glassware, Anderson Self-Adjusting Arms, and Illuminating Service.
"Service to Lamps"
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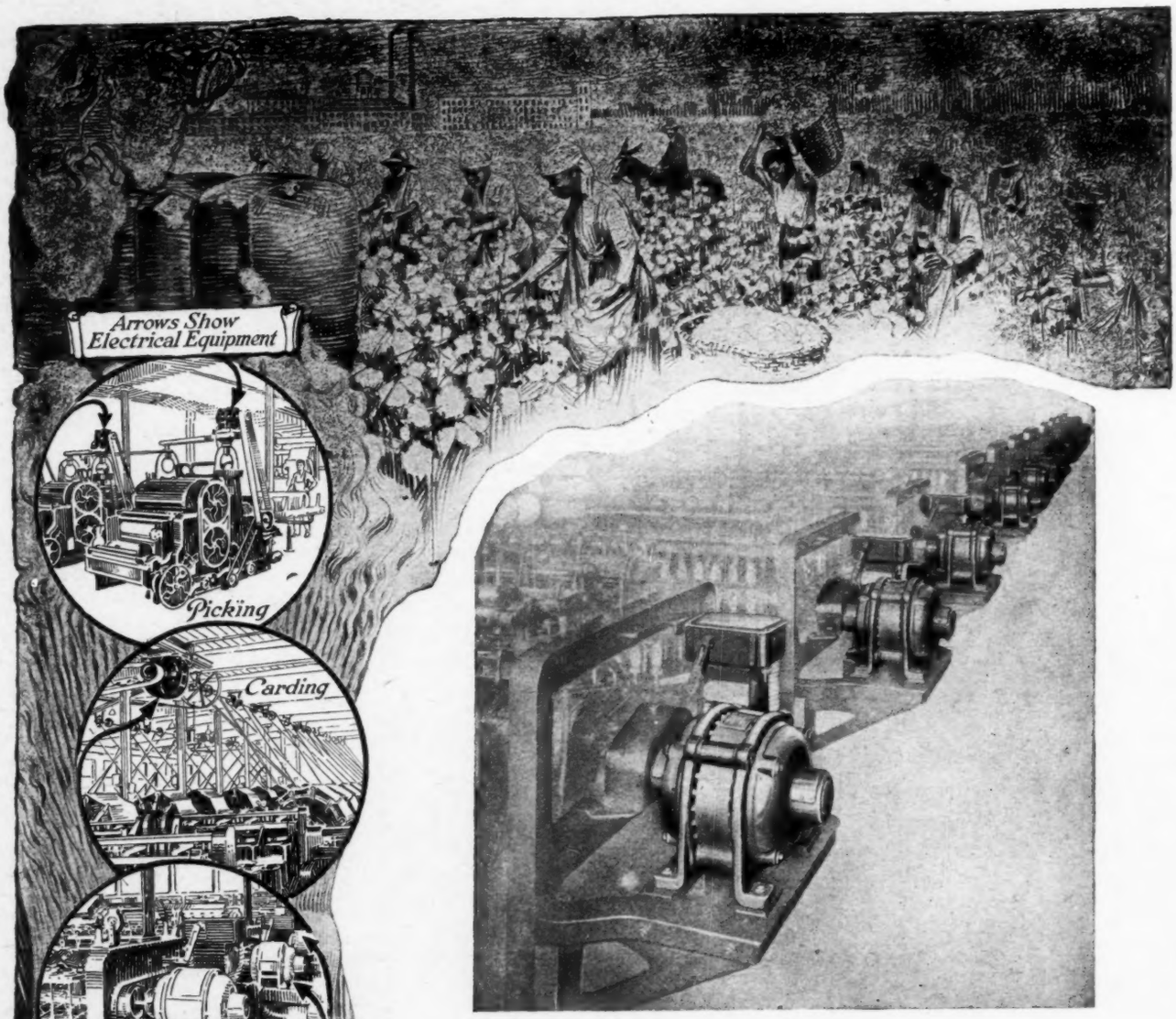

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Electric Power From Standard G-E Motors Is Ideal

Electric power from G-E Motors is used in textile mills to assure correct power conditions for maximum production at least power cost.

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The "safety first" control equipment for these motors is automatic and affords complete protection, thus making possible continuity of operation.

Call in our specialists to assist in solving your power problems.

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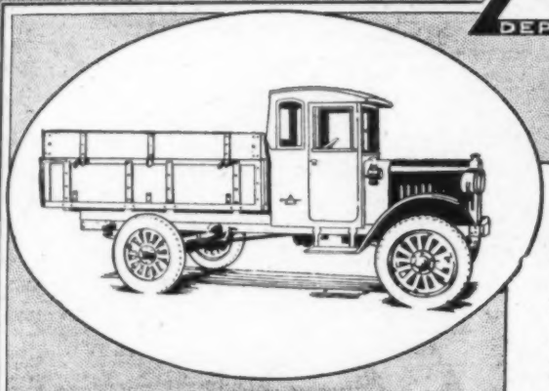
A Three-Fold Value

3/4 · 1½ · 2 Special & 2½ Ton Models



A "Real" 3-4 Ton Truck

The **Triangle** Model AA illustrated herewith is the **only** truck of its size built **wholly** from **high-grade genuine truck units.**

No adapted pleasure-car equipment is used. Consequently it possesses all the power, flexibility, service and dependability of the **Triangle** line.

A 25-horse Herschell-Spillman motor is employed. The balance of the truck is practically identical with the larger models.

This means that Model AA is in every sense a "Real" truck and its rating is unusually conservative.

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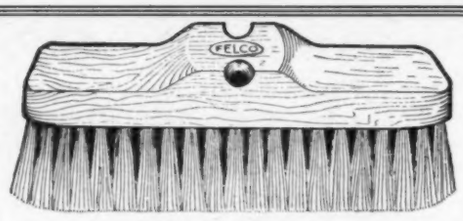

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IT takes a good brush to stand the use and abuse of long and severe service, and mill men recognize the superior quality of

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They are made from the best material and by expert workmen.

There is a brush for every use at the lowest price consistent with the high standard of quality.

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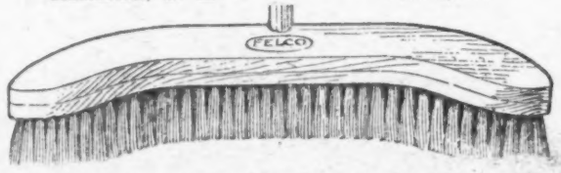

Felton Curved Floor Sweep for Spinning Room Alleys.

COTTON

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This Issue 5,500 Copies.

Volume 84 Number 4

YOUR OPINIONS AND IDEAS.

The manager of a large cotton mill recently wrote us:—

"I am always delighted to receive COTTON and read same carefully. I heartily agree with your ideas on Industrial Democracy.

"I am enclosing a copy of 'Labor Principles' as laid down by the State Manufacturers' Association of my state. This may interest you.

"I am also sending you a booklet published by the Roycroft Press, which you possibly have already read, but if you have not would recommend your looking over same."

It is through such interchange of ideas that COTTON is able to render a distinct service to its readers. You may or may not agree with the viewpoint of the editors and contributors of COTTON on each subject. But whatever your opinion, after you have read an article that is of special interest to you, won't you ring for your stenographer or reach for the dictating machine and give us your opinion? Your opinion will be welcome and the editors will withhold your name in printing your suggestions, if this is your request.

Then there are many little seemingly insignificant ways of doing things in your mill that would be of direct interest to the other readers of COTTON. Descriptions of these methods will make excellent articles. Not only will such articles be interesting, but what is of more value, they will put forth suggestions and methods that are successfully solving problems that are common to many mills.

Each article used is paid for by the editors. In return you get the ideas and plans that other manufacturers are using, many of which are directly applicable to your mill. COTTON is your paper. Use it freely in your exchange of ideas with other manufacturers.

CONTENTS.

EDITORIAL—

The Cotton Mills Are Helping 231
Building Up Morale 231
Railway Brotherhood Seeks Education 231
Industrial Nursing 232
An Interesting Report 232
Interest in Fuel Oil Extends 232
The Same Old Wooden Shingle 232

GENERAL AND TECHNICAL—

A Plan to Promote Industrial Efficiency 233
Studying Cotton Fiber Within the Boll 234
What Foreign Exchange Means 238
Manipulation of Short-Fibered Cotton 241
Cotton Fabric Designs 243
The Finishing of Pocketings 245
Venezuela as an ExportMarket 247
"Why Read?" 249
Industrial Relations at the Ballard Mills 251
What the Southern Mills Are Doing 253
The New England Mill Situation 255
Cotton Comment 258
The Yarn Market 258
Notes About Men You Know 262
Two Questions for Carders 265
Read Trade Magazines 265
A Certificate of Working Interest 265
Cutting Costs 266
The Index Number Wage System 269
Warp Preparation 273
Flowers and the Workers 275
A Good Roll Varnish 277
The Vat Dyestuffs 277
Good Running Work Means Contented Labor 279
Kapok and Its Hazards 279
Reducing Accident Hazard in Textile Mills 283
Industrial Organization 287

KNITTING SECTION—

Joint Meeting of Knitters at New York 291
Designs for the Knitted Coat Trade 293
In the Foreign Field 295
The Knit Goods Market 297
Among the Knitting Mills 301

WHAT "MEMBER OF ASSOCIATED BUSINESS PAPERS, INC." MEANS TO THE ADVERTISER.

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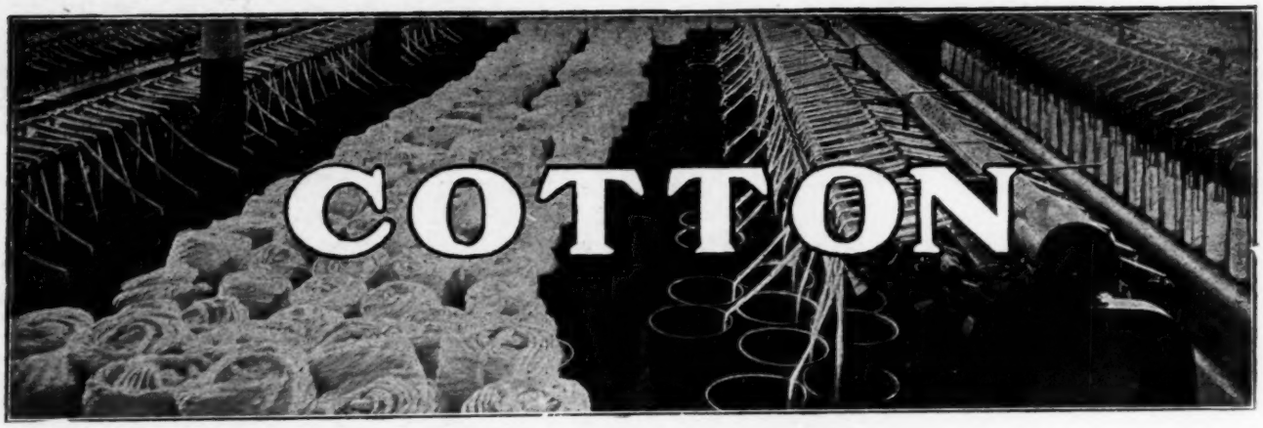


February Nineteen-Twenty

The Cotton Mills Are Helping.

The seventh annual report of the Children's Bureau states that many American-born children are growing up illiterate. Of 19,696 children between 14 and 16 years old, to whom certificates were issued under the Child Labor Act of 1916, more than one-fourth could not write their names legibly. Nearly ten per cent had never gone beyond the first grade and considerably more than half were in the fourth grade or lower when they left school. Only about three per cent were in the eighth grade and about one in a hundred had reached high school. These children were native Americans.

The establishment of part-time schools at cotton mills under the direction of the Federal Board for Vocational Education, a description of which was printed in the January number of COTTON, will go far to remove this difficulty in the textile sections of the South. Such a school, conducted for 48 weeks each year, and making attendance compulsory if the person is to work half-time in the mill, will do more to increase school attendance and improve the literacy of the class in question than all the educational laws so far written upon the statute books of the several southern states.

Cotton manufacturers are leading the way—as usual.

Building Up Morale.

Another and more advanced step along educational lines is being seriously considered by Fall River mill treasurers. This is to select a number of young men who have shown exceptional ability in their mill work and send them to a textile school at the expense of the mill, paying them for the time so occupied at the regular rate earned in the mill. This is following a suggestion by Henry W. Nichols, principal of the Bradford Durfee Textile School of Fall River.

It is presumed that a certain percentage of efficiency in studies will be demanded from such scholars, as this would keep all slackers out of the ranks of these preferred workers. Also, arrangements will no doubt follow which will allow promotions in the mill, as vacancies occur, to be made from the ranks of these technically educated young men.

The Fall River Cotton Manufacturers' Association was so favorably impressed with the plan that it sent to all its members a strong recommendation for favorable action. Many individual superintendents and treasurers have declared themselves in favor of the plan, not only as a factor in building up morale, but also to provide an adequate source of supply from which men may be drawn to fill the minor executive positions in the mills.

While no specific plan has been completed by southern mill men to accomplish this same result, President Hammett of the American Cotton Manufacturers' Association, in his public utterances, has frequently advocated some proposition of this kind and a number of sporadic cases might be mentioned where individual mill men have taken action on special cases brought to their attention.

Railway Brotherhood Seeks Education.

Under a January date line from Detroit comes the announcement that the officials of the Brotherhood of Maintenance of Way Employees and Railway Shop Laborers have purchased for the Brotherhood some knitting mills at Ypsilanti, Mich., a glove factory at Williamston, Mich., and a tubing factory in New York State. It was also stated that negotiations were being conducted for the purchase of two other mills at Toledo, Ohio. The initial investment is said to be around a million dollars. The product of the mills is to be sold direct to the members of the union thereby effecting an expected saving of from 25 to 60 per cent on individual purchases. Warehouses in several localities are proposed for distributing purposes.

This is "fine business." Of course the Brotherhood owners will operate "closed shops," and it is unthinkable that they will refuse to grant any demands made by the United Textile Workers in their employ. It is only just to expect a chain of establishments ideally managed from the viewpoint of the employees. High wages—short hours—holidays—certainly! How could it be otherwise? The Brotherhood officials seem to expect this as one of them is quoted as saying, "We don't aim to make money. If we face a loss at the end of the year it will be no great disaster, since in the meantime our members will have easily made up the deficit by their personal savings."

It is also reasonable to suppose that the "members," after saving the proposed "25 to 60 per cent" on their gloves, hosiery and underwear, will be delighted to contribute these sums and any other adequate amounts from their "personal savings" in order to keep their brother unionists in the textile field prosperous and happy.

When these plants get working satisfactorily, it is proposed to broaden the field and take up boots and shoes, and probably foodstuffs. This means that ultimately the farmers will have to be unionized and work 30 to 40 hours per week at a minimum wage of $100 a week, like the garment makers and brick layers, otherwise the Brotherhood members will have to start a back to the farm movement, as they surely would not care to eat foodstuffs that were grown by scab labor.

Verily the millenium approacheth!

Industrial Nursing.

That trained nurses are being employed in increasing numbers shows that employers generally are recognizing their services. Previous to 1919, only 66 industrial firms employed trained nurses. Today more than 871 industries have nursing services. The industrial nurse has proved to be a good investment. She is a teacher of hygiene, and health education means prevention of accidents. One neglected cut will show the value of the industrial nurse.

The industrial nurses of the National Organization for Public Health Nursing plan to form an Industrial Nursing Section of the National Organization at the meeting in Atlanta next April. The object of this section will be the formulation and maintenance of high standards for nursing service in industry. It is planned to make known to nurses throughout the country the opportunities for education for industrial nurses. Opportunities exist or may be developed in many large centers. The program will be of interest both to industrial nurses and to employers.

Qualified nurses are eligible to membership. Employers are eligible to corporate membership. Associations of employers, of employers and workers, or of employees, are eligible to corporate membership.

All industrial nurses are urged to attend the Atlanta meeting and employers of industrial nurses are urged to send nurse representatives. If the nurse becomes an active member, she will have a vote. In any case, she will learn what other industrial nurses are doing and she will return to her duties with renewed energy and inspiration.

An Interesting Report.

The Research Committee of the National Council of Cotton Manufacturers has just issued its third report on international prices for cotton cloth and analysis of foreign trade in cotton goods before the war. The members of the committee are A. Farwell Bemis, Boston, chairman; Jno. A. Law, Spartanburg, S. C.; John S. Lawrence, Boston; and Melvin T. Copeland, Harvard University, secretary.

The comparison of prices of cotton cloth in New York and Manchester, England, shows that on March 6, 1919, the English prices were 19 per cent above the New York prices for standard gray cloth at the current rates of exchange. By the middle of April, the English prices had fallen below New York prices at current rates of exchange, and from the middle of May until the end of September, the English prices were from 10 to 18 per cent below the New York prices.

Prices for grey cloth in Shanghai were 70 per cent above New York prices on March 27, 1919. On August 7 they were 10 per cent above New York prices.

In Calcutta prices at current exchange were 41 per cent above New York prices March 6. On May 29 they were 5 per cent below New York prices, and on August 14th 4 per cent above according to this report.

In the analysis of foreign trade, statistics are summarized for the sixteen years before the war, showing the chief markets to which cotton cloth was sent from each of the cotton manufacturing countries of the world. It is the conclusion of the committee that for several countries, with the exception of Germany, their respective colonies and protectorates were especially prominent markets for the cotton cloth exported. This holds true for the United States exports to the Philippines, the British exports to India, the French exports to the French colonies and protectorates, the Belgian exports to the Congo, and the exports from Holland to Java and the other Dutch East Indies.

Interest in Fuel Oil Extends.

In connection with the fuel oil situation in New England it is of interest to note that the Maverick Mills of East Boston, Mass., makers of fine cotton cloth from combed yarns, are installing oil-burning equipment. The plant of the concern has 1600-boiler horsepower to equip in the new manner. It will use 30,000 barrels of fuel oil per annum, in lieu of 7,000 tons of coal. It is stated that a five-year fuel oil contract has been closed, at about half the present cost of coal.

Furthermore, it is reported that the entire Pacific Mills plant at Lawrence, Mass., will soon extend the use of oil burners to all departments.

In taking up the problem of sufficient storage capacity for fuel oil, a number of the mills at New Bedford have hit upon the expedient of constructing underground reinforced concrete tanks. The first, and one of the largest in this fine-goods center, has been undertaken by the Beacon Manufacturing Company. It is planned to be oblong in shape, with rounded corners. It will be 50 feet one way and 60 the other, with a depth of ten feet, having a capacity of 133,500 gallons.

The Same Old Wooden Shingle.

A short time ago fire was discovered at one of the cottages in a southern mill village. It seemed possible that sparks from the chimney ignited the wood shingle roof. It was extinguished with slight damage, but two days later again caught from the same cause. The damage from both fires amounted to about $150, or approximately the price of a fire resisting roof that would not catch from sparks and would outlast two or three wood shingle roofs.

Four days later another house was practically destroyed in the same village with a loss of about $1.300. It was the opinion that a spark lodging in the shingle roof, which was an old one, had smouldered for several days before the roof finally burst into flames shortly after midnight.

At another southern mill village about two weeks later, at 6:20 in the morning, sparks from a chimney set fire to the wooden roof burning a hole therein.

Such examples make excellent practice for the mill fire department, but with the present high cost of lumber and labor it would seem as if it might be greater economy to use roofs of a fire resisting nature.

A Plan to Promote Industrial Efficiency

BY "NORTH STATE."

The great danger facing the industries of this country from the present labor movement is that it places the employee in a position where he cannot see that his welfare is dependent upon the welfare of the institution in which he is employed. An unbridged chasm is placed between the point of view of the manufacturer and the point of view of the workman. To bridge this chasm is the primal problem before the industrial leaders of today.

Every man who is placed in a position in which he is responsible for the work of other men must have the point of view of the manufacturer, because he sees that his success is absolutely dependent on the efficient execution of the work under his supervision. But it is not always necessary for a man to be placed in a position of responsibility to secure this point of view. The moment that the humblest operative in a plant aspires to a position of authority and responsibility, the successful operation of the machines under his care has the same significance to him that the successful operation of the mill has to the man who owns or controls the plant. Every foreman and assistant foreman must at some time have had this attitude to have secured the position he now holds, but to retain this point of view he must feel that there are no immovable obstacles to his future unlimited advancement. It is not impossible to have a manufacturing establishment in which every man realizes that the success of the business and his success are one.

"Any form of democracy, taken solely from an economical standpoint, is highly inefficient. An organization to function actively, quickly and without lost motion must have centralized control and responsibility. A plant controlled by a board consisting of all the great industrial experts in the country would not operate with the same success that it would under the control of any one member of that board."

Constructive criticism is always best, and this author first proposes a plan before censuring some existing plans. Comments are solicited and experiences desired as only by a comparison of present practices and the results obtained may we hope to achieve the highest pinnacle of success.

How do you handle the labor problem at your mill?

This spirit, in varying degrees, has always been characteristic of American industries, as well as of all the institutions developed under American government; and to this spirit must be attributed a large part of the wonderfully successful development of American business institutions.

The proposition is how to foster and develop this spirit. This idea should be "sold" to every man and boy employed by cotton mills or other plants. The manufacturer should do this for his own selfish good; but in doing so he will be working for the common good of all the people of this great country.

As an aid in the suitable development of this spirit opportunities must be offered the workers for personal development and advancement; all obstacles must be removed. More than that, especial attention must be called to these opportunities—they must be placed before the operatives in such a way that they cannot get around them. A man's imagination and his ambition must be aroused. He must be imbued with the spirit that makes for his success and the success of the business in which he is engaged. Concrete examples must be placed before him by repeatedly filling vacancies in positions of authority from men in the ranks. Men must be developed in advance who are able to handle these positions. Every man who secures a foothold on the ladder of success strengthens the organization of the plant in which he received his opportunity. Napoleon said that every soldier in his army carried a Marshal's baton in his knapsack; but more than saying so, Napoleon's soldiers did become Marshals of France; and Napoleon's army for organization and efficiency has seldom been equalled.

The foregoing plan may be carried out in a number of ways which will suggest themselves to operators of industrial plants. Schools in which the operatives may learn the technical features of the industry in which they are engaged should be made available; and hours for attendance must be made convenient for the employee. The mill should be canvassed and the plan explained and presented to all employees, and especially to parents, that their children may be urged to take advantage of the opportunities offered. Especial plans must be made and presented to foremen and overseers in order that they may catch the idea, and that it may be extended through them to other employees under them. The foreman is the manufacturer's direct point of contact with his employees, and his influence can make any plan a success or a failure.

In addition to organized school work, the educational idea can be further extended by lectures given by men of recognized authority and ability in different fields. For example, in the textile industry, experts can readily be obtained to lecture on any phase of the industry from the fiber in the fields to the completed fabric; and the many interesting details of cotton manufacture in its entirety can be presented in such a way as to allow the man whose whole time is spent in a single department to grasp the aim and purpose of the processes with which he is familiar by contact.

The important thing is for the manufacturer not to undertake the plan in a half-hearted manner, and then condemn it as a failure and his employees as unappreciative. No instantaneous results may be expected, but lasting and gratifying results will surely follow a vigorous and intelligent development of such a plan.

The idea can only be successfully "put across" by propaganda. The working people of the country are certainly bombarded with enough radical, erroneous and seditious propaganda to make any wandering away from safe and

sane policies not only explainable, but in a measure excusable. The American government combatted the propaganda of the German government successfully with American propaganda; and the people of America can combat the radical propaganda originating among the misled and irresponsible products of foreign revolutions by a propaganda that sells to the laboring people the true spirit of American freedom and American opportunity.

Experiments are now being made by a number of manufacturers with the plan known as "industrial democracy," some of whom are reporting satisfactory results. This plan would doubtless give temporary relief in some cases from a strained and undesirable situation; and will allow some manufacturers to operate their plants successfully as long as market conditions justify more emphasis being put on production-at-any-cost rather than efficiency. But the plan is obviously a compromise with a dangerous doctrine, and to adopt it is to temporize with an evil instead of combatting it. We hear a great deal these days about the radical theories "that a workman should own his own tools," that manufacturing establishments should be taken away from the owners and given to the people who work in them, but any plan that makes concessions to this dangerous idea should be avoided.

Any form of democracy, taken solely from an economical standpoint, is highly inefficient. Democracy in government is a very expensive commodity; but it is well worth the price as long as it guarantees "life, liberty and the pursuit of happiness" to the governed. Democracy in business has no justification, for the success and existence of American industries depends on the development of economic efficiency. If the plan known as "industrial democracy" is adopted by a manufacturer, a very real part in the management and control of the business must be delegated to the operatives of the plant; otherwise the people will soon see through the coating of the sugar coated pill that is handed them. And when the operatives are allowed to take an active hand in the management of the plant, the efficiency of the institution must necessarily be lowered. Any organization to function actively, quickly, and without "lost motion" must have centralized control and responsibility. A plant controlled by a board consisting of all the great industrial experts in the country would not operate with the same success that it would under the control of any one member of that board. A plant in which control is shared by a body of men who lack training, experience and other necessary qualifications, will be greatly handicapped when the time comes, "as come it will for a' that," when the industrial plants of the country will be competing against one another for business, and when manufacturing efficiency shall be an absolute requirement for manufacturing success.

The real menace of the Plumb plan for railroad management is not in the attitude of the rank and file of the brotherhood members, but in the effect of the Plumb, Stone and Garretson talk upon the radical, socialist element that exists in our society and permeates American labor. This talk will galvanize into new activity the remaining members of the moribund I. W. W. It will be hailed by the ill-regulated minds in the purlieus of great cities as an indication that the brotherhoods are coming to the aid of the revolutionary proletariat in their truceless war against capital.

Studying Cotton Fiber Within the Boll.

BY DANIEL E. DOUTY.

MICROPHOTOGRAPHS BY FRANCES E. HALL.

The stage of growth of the cotton boll at which the cotton fiber begins to take form and the gradual development of the fiber within the boll has probably been carefully studied by botanists interested in the cotton plant and it is possible that photographs have been published showing this wonderful evolution of fiber from viscous liquid. We do not happen to know where the information has been published and feel reasonably sure that it is not at present available to the readers of COTTON.

Therefore, without any claim to originality or as a contribution to the knowledge of the cotton plant, the accompanying microphotographs are reproduced for the information of those who might be interested.

The entire series from the blossom to the open bolls was collected from a cotton field near Memphis, Tennessee, at the time the special trains from the World Cotton Conference at New Orleans stopped there. Beautiful blossoms and dry, fluffy, completely open bolls with all the intermediate stages made the field a most interesting sight to anyone not familiar with the growing cotton.

The microphotographs are of the same magnification (500 diameters) and the widths of the fibers in the various stages are comparable.

The numbers correspond to the numbers of the bolls shown in the series photograph and the fibers were taken from the bolls from which this photograph was made.

No. 1. Contained no trace whatever of any fibrous formation and was filled only with a viscous, syrupy fluid. The blossom had just fallen.

No. 2. Shows the beginning of the fibrous growth. The fibers are flat and quite broad, 1/16 inch in length, imbedded in a thick, sticky liquid. There is no evidence of any lumen or tube through the center.

No. 3. Same as No. 2, with fibers much larger and about ⅛ inch long.

No. 4. Fibers about ¼ inch, no mark of lumen and wet but easily separated.

No. 5. Flat fiber much narrower, ⅜ to ½ inch long, just beginning to show lumen and slight indications of twist; wet but easily separated.

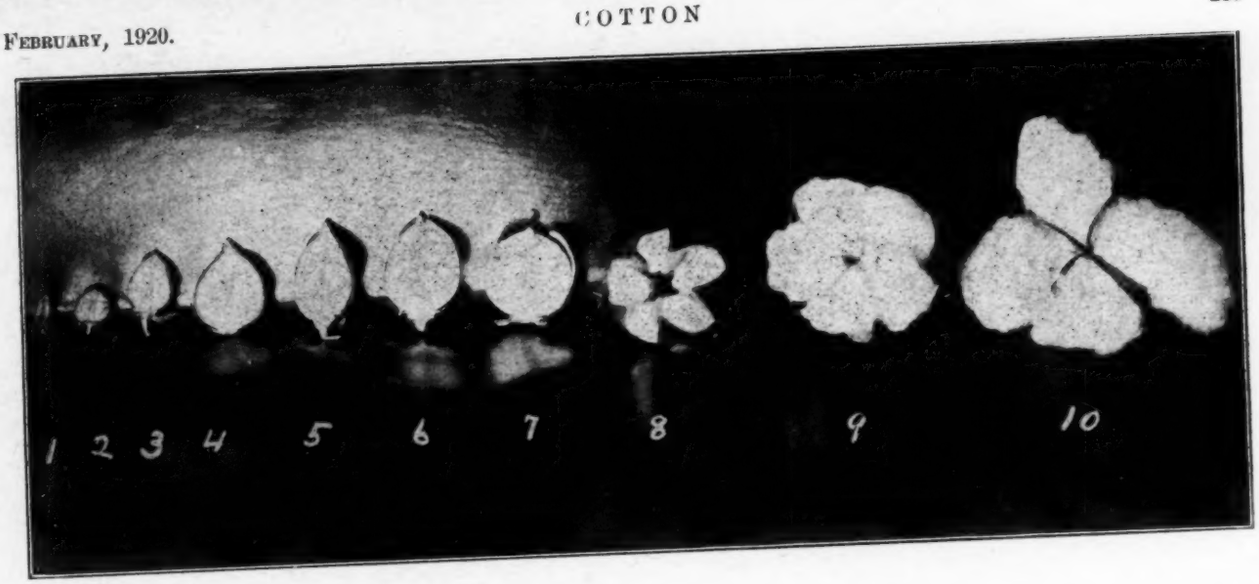
No. 6. Flat fibers ¾ inch long, showing lumen and beginning to show rolled edges as though beginning to collapse. Also showing decided tendencies to twist; damp.

No. 7. Characteristic, full grown, ripe cotton fiber, still damp, 1 inch long showing decided twist and, where flat in photograph, shows well defined lumen.

Nos. 8, 9, 10. Characteristic, ripe, cotton fiber. Dry, ¾ to 1 inch showing decided twisting, distinct lumen with collapsed walls, and the rolled edges which indicate that the edges are thicker than the center.

The fact that the cotton fiber is a flat, ribbon-like, collapsed tube, twisted several times in its length, makes it such an excellent textile material. The twisting of the fibers themselves causes them to lock and felt together in the spinning operation. The breaking of cotton yarn is generally due to the slipping of the fibers upon each other

*General Manager, United States Conditioning and Testing Co.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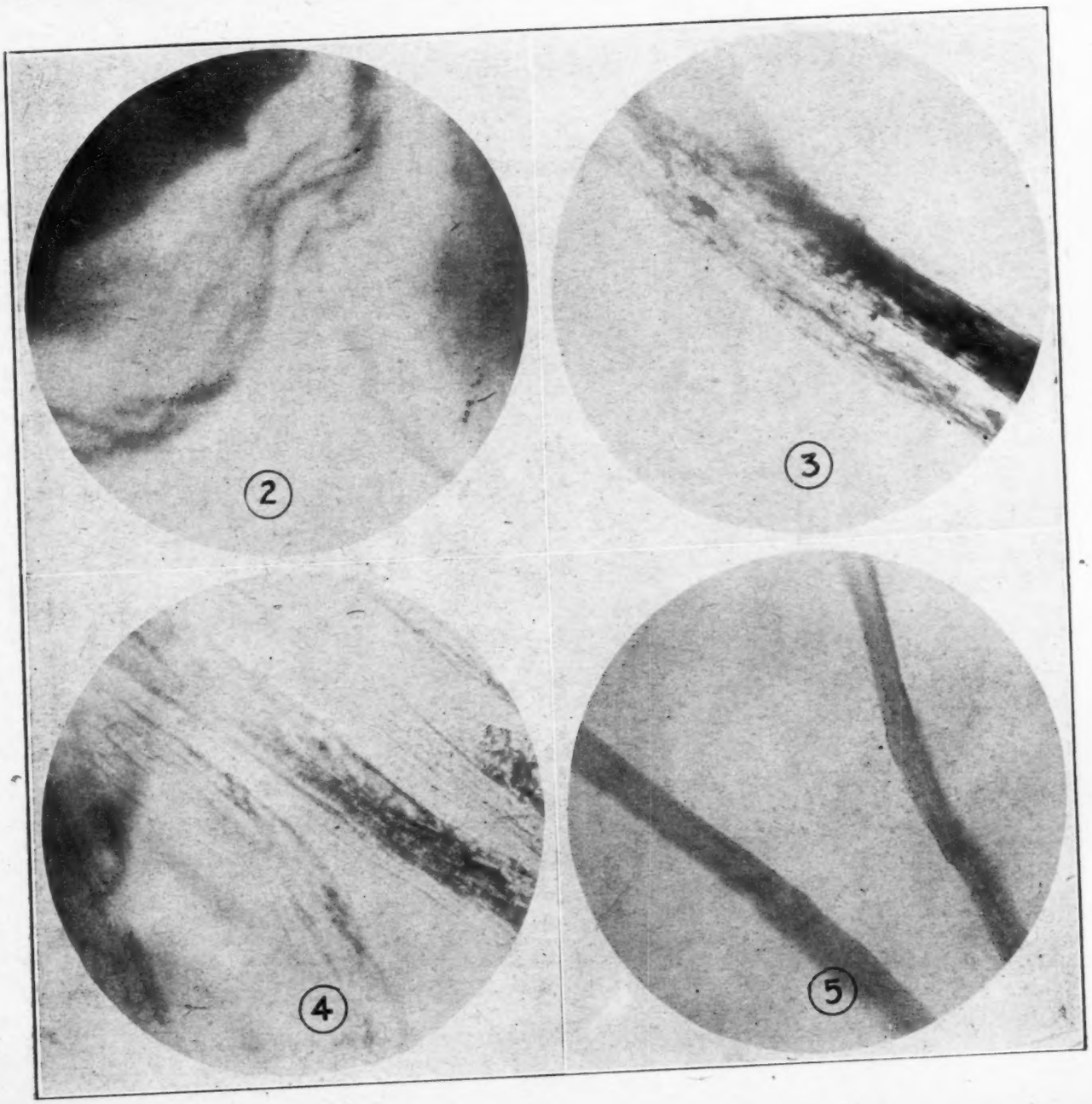
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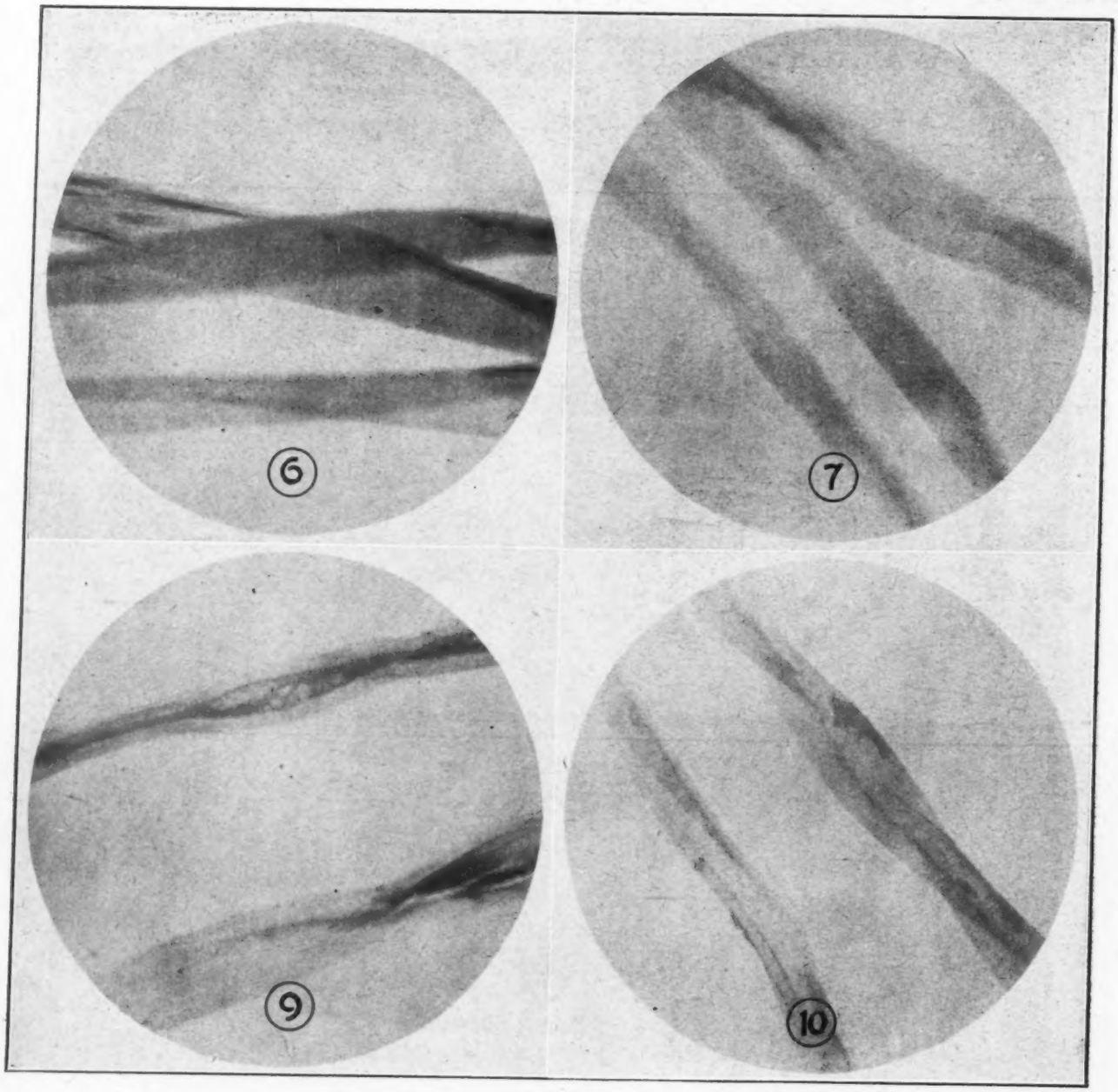
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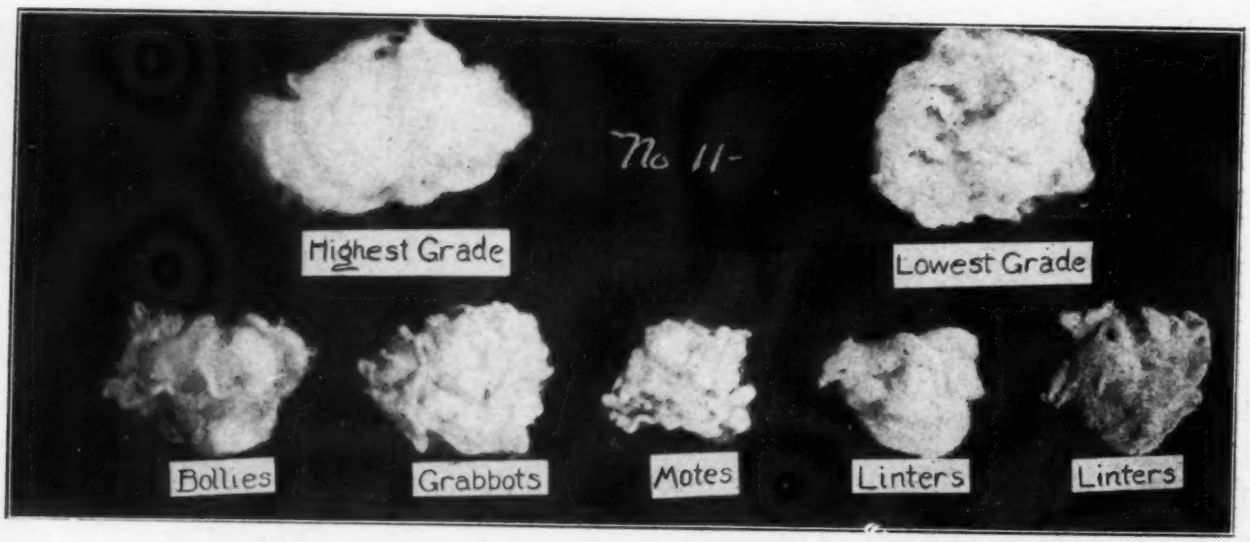
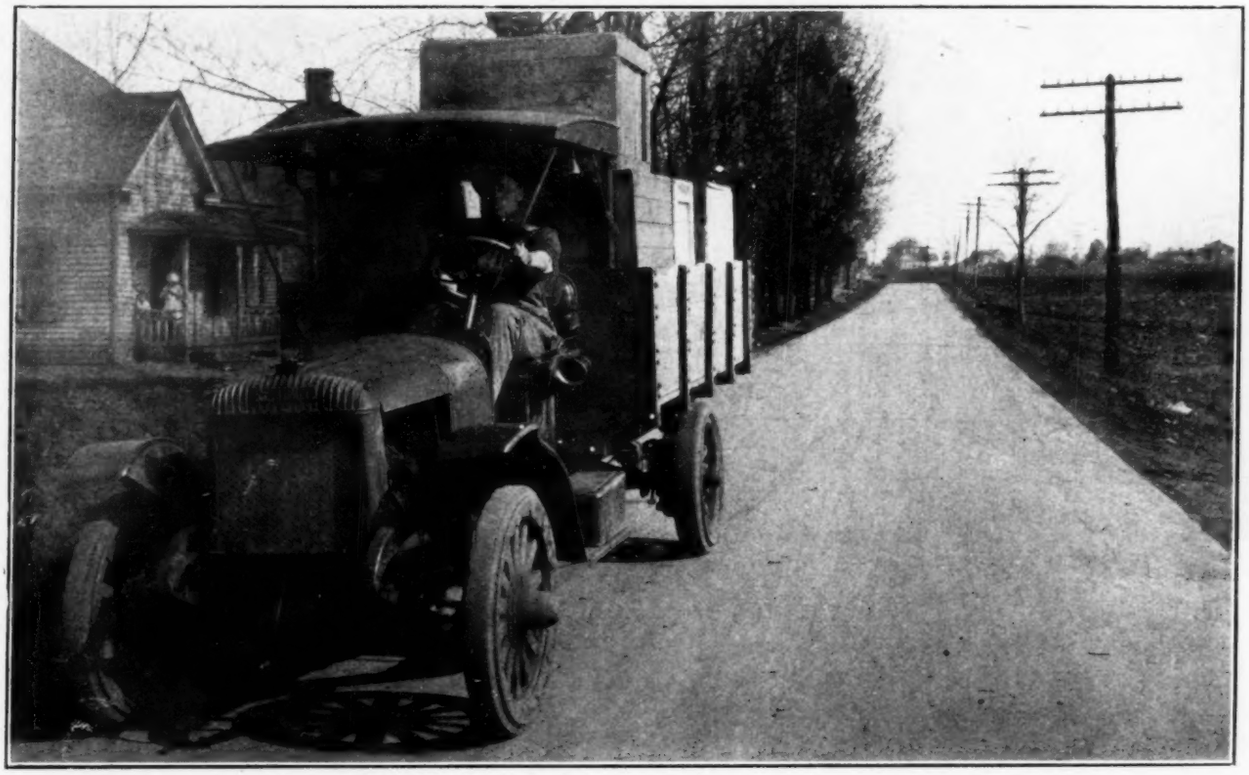

No 11-
Highest Grade
Lowest Grade
Bollies
Grabbots
Motes
Linters
Linters

rather than the breaking of the individual fibers. Of course, some of the fibers break but in general they are only a very small proportion of the fibers in the yarn. If this were not so, the tensile strength of yarn would not increase so markedly with the increase of twist, within reasonable limits. Therefore, fundamentally it is desirable to preserve the twist in the fibers, i. e., their felting qualities, so far as possible in the processes through which they pass in textile manufacture.

Photograph No. 11 shows bits of cotton from the bales prepared at Memphis, Tennessee, to illustrate the terms used for classifying the various fiber stages. It is a very good example of the use of photography in showing changes in characteristics in textile materials. As a matter of fact the differences appear more pronounced than in the samples examined directly.



A MOTOR TRUCK FROM THE UNION BLEACHING AND FINISHING COMPANY, GREENVILLE, S. C., TRANSPORTING A LOAD OVER GREENVILLE'S CONCRETE ROADS.

Traffic Methods in the New South.

In the years gone by, and not a great many at that, good roads were never dreamed of. Gradually the dreamers came into existence and by degrees they are making their dreams come true.

We all remember when the horse was the chief means of locomotion for hauling and while the animal is still used to a large extent for this purpose and will be for a great many generations to come nevertheless we have all seen him replaced to a very great extent by mechanical locomotion. Naturally you ask, why this change? It is true that we live in an inventive and advanced age but is that the chief reason? Do you remember that just a short time ago that you considered about two round trips to a place five miles distant with a horse-drawn wagon a good day's work? Today this trip is made in about two hours. Not with the horse-drawn wagon but with the automobile truck. But we should not draw our conclusions too fast for the simple reason that when the horse was making two trips a day the truck would not have made any for the very good reason that the roads were in no condition for this class of traffic.

For the speed and progress of the twentieth century we were moving too slow. How could we speed up and progress? The only logical way was to improve our roads. In the few years of real road development we have seen many types of road tried and many of them fail. When we think of good roads we think of a smooth surface devoid of ruts and holes. Therefore in what type of road have we found our ideal more fully satisfied than in the hard surface road?

The nation has to be fed and clothed and in order that this may be done, from the largest metropolis on down through the cities, villages, to the remotest farm house in the wilds we hear the call of good roads, better roads and more of them.

The Tupelo (Miss.) Cotton Mills are sending out New Year Greetings in the form of an attractive little booklet, the purpose of which is "to tell you the story of the industrial goodwill of the Tupelo Cotton Mills." In this booklet are shown views of the welfare work being done in and around the mills, beautifully colored reproductions of photographs of the fabrics manufactured in the mill and pictures of garments made of Tupelo cheviots. The story in the book is in the form of a visit through the mill and village and is written up in a very catchy style. On each page is a drawing of "Tupelo Joe," a typical southern negro, whose comments on the different phases of the mill work and homely philosophy contain many truths.

What Foreign Exchange Means

BY HENRY HAZLITT.

Readers of the financial pages of the newspapers see a great deal these days about foreign exchange rates. They are told that sterling has dropped to $3.65, that francs have been to 11.37, that lire are down to 13.52, and that marks, normally worth 23.8 cents apiece, could recently be bought below 2 cents.

Yet what do all these figures mean? Why is there such a hubbub about them? Why are a lot of people running around and shouting that something must be done about them? Why do they say we must grant credits to Europe? What have credits got to do with these figures? These are questions which run through the mind of the average man, even the average Wall Street man, or the bank clerk who does not happen to work in the foreign exchange department. He vaguely realizes that when rates go up or down somebody has an opportunity to make a profit or a loss; but isn't it something that concerns only bankers and why should they try to interest anybody else in it? What has the exchange rate to do with you and me, and other honest folk that go about their business?

They understand these things better in London, because London has been for centuries the financial center of the world. It has been the Clearing House of international trade. Before the war a merchant in Uruguay who had sold some goods to a merchant in Chile would get his payment by a bill drawn on London. Foreign exchange rates are going to mean more and more to us in New York, and it behooves not only everyone in the banking business, but everyone who is interested in business conditions in general, to know what they mean, in order that he may not be ignorant of so fundamental a phenomenon and that he be able to interpret their effect on his own business. Moreover, as we shall presently show, our very prosperity at the present time may depend on whether our people as a whole understand the significance of these exchange rates and the means required to stabilize them.

The so-called mysteries of foreign exchange repel and awe the seeker after knowledge at the very beginning. He has first to learn the names of foreign coins, then exactly how much they equal, and then the method of their quotation, which, for no logical reason whatsoever, except that foreign exchange just grew, and that it was nobody's particular business to see that it grew consistently, differs for almost every coin there is. In some cases, as in pounds, the quotation is in dollars per pound; but in francs it is francs per dollar, so that when francs are 11.10 on Monday, and go to 11.20 on Tuesday, the newspaper headlines talk of a "decline" in franc exchange. This is too much for the seeker after knowledge, so he turns to the sporting page.

However, we shall overlook for the present the coins and their quotations, which after all concern only those who are in the business of foreign exchange, and come immediately to the principles involved which concern everybody and are not difficult to grasp.

The first thing to plant in the mind is that foreign trade is normally and always ultimately an affair of barter. The goods that we send to Europe are paid for by the goods Europe sends to us. We send England wheat, say, and take linen in exchange. As we grow wheat to greater advantage than England, and as England can manufacture linen to greater advantage than we, the exchange is mutually profitable. It is obvious that we cannot keep on selling goods to the outside world without buying any goods in return. We have got to get paid for our goods somehow. In money, you say. But in whose money? English currency cannot circulate here. In gold, you say. Very well, that is exactly what is used when a country hasn't enough merchandise to offset the merchandise you send it. Gold, in other words, is a means of making up the difference between purchases and sales when absolutely nothing else will do. Between nations payment in gold is not the first thought, but the last resort.

It is not difficult to see that this should be so. When we send beef, cotton, copper, wheat and coal to the outside world, we deprive ourselves of these commodities as consumers, and their prices are higher in this country than they otherwise would be. If we take other merchandise and goods in return, we more than make up for this loss. But if we take gold, we cannot eat the gold, and we can wear it only for ostentation and not for comfort. Its sole use is to buy things. As individuals it is profitable for you to get more gold, because then we can command more goods from somebody else, but as a nation this would not profit us. If the supply of gold were increased in this country, and nothing else were added, the only effect would be to raise prices all over the country. Everybody having more gold would offer it in exchange for goods, and the competition among the gold holders would cause them to offer more. There might be a redistribution of wealth, depending on the persons to whom gold happened to go, and in what ratio different persons held of goods that were gradually going up in price and of gold that was gradually going down in purchasing power. The country as a whole, having no more necessities or comforts than before, would be no better off. It would be worse off, for it would be minus the goods that it had sent abroad.

All this is not a lurid picture of an imaginary country in an imaginary world. We ourselves tried the experiment of taking in gold a large part of the payment for our goods sold to the outside world during 1915 and 1916. Europe, mainly England, sent us more than a thousand million dollars of the metal, so that we now hold about one-third of the world's gold supply. That is all very nice for us as a nation to brag about, but it is also one of the leading reasons why most of us are growling about the high cost of living and the so-called fifty-cent dollar.

But this question of gold can be dispensed with even more easily. There is less than ten billion dollars of money gold in the whole world, and as we already have a third of it, that leaves only six or seven billions for the rest of the world. Now as we sent more than seven billion dollars worth of goods to the rest of the world in the year ended June 30 last, the rest of the world, if it could not pay in goods, would have had to send us all of its gold just to buy one year's exports. How could we sell to it in the following years? Less than half a billion new gold is produced each year. The rest of the world would end by paying

*Extracts from an article in the M. & M. Journal.

for our goods with other goods anyway, so it might just as well begin by doing that.

There may still be people unconvinced. "I'm in the export business," I hear someone say, "and you can't tell me. I don't take other goods in exchange for my goods. I draw on my foreign customers, or they send me a remittance, and I take it to my bank and the bank gives me the cash. And I keep on doing that year in and year out, and every other exporter is doing the same thing." That is all very well, but the person that is paying you the cash is not the customer to whom you sold the goods. Neither is it, ultimately, the bank. It is some other American, somewhere, who has bought goods from Europe. He doesn't pay the person from whom he buys the goods. He pays you. And he is probably as unaware that he is paying you as you are that you are being paid by him. The wondrous mechanism of foreign exchange bills, as simple as it is deceiving, has created an illusion for both of you.

Having our common sense affronted by a process by which the buyer does not pay for goods and you are paid by somebody who owes you nothing, let us see what really happens.

The first thing to get out of our heads is the conception of bankers as people who use their own money. They do sometimes, but not normally. Ordinarily they are merely go-betweens, agents, and the commission they receive is due to their services in bringing two persons, neither of whom knows the other, to perform services for each other.

Say that one of us is an American exporter, that he sells $1,000 worth of wheat to a merchant in Liverpool, and that the arrangement provides for the American getting his payment in dollars in New York. The English merchant will send him a note, which says that he owes the American $1,000 for the wheat. The American takes the "bill" to his bank and gets $1,000 for it. Naturally he imagines that the Englishman has paid him the $1 000. But how is the bank able to pay him his $1,000? Where does it get the money from? It does not get it from the English buyer, and it does not get the money from its deposits. If it held no deposits it would get the money anyway. Somewhere else will be an American importer, who has bought linen from an English merchant, say, also to the value of $1,000, and the arrangement provides that he shall make payment for it in London in pounds sterling. In other words, to make that payment he will want to buy a credit in London. He will go, say, to the same bank, and offer to pay it $1,000 for such a credit. Now the bank has already bought a bill for $1,000, and this bill is nothing less than a claim on London for an equivalent amount in pounds. It bought the bill precisely in order that it might sell it (or what is the same thing, another bill against the credit which it represented) to just some such importer who might come along. Therefore it gets the American linen buyer's $1,000, which offsets the money that it had to pay for the credit.

Now look at what has happened. In effect the American wheat seller has sold his claim on London to the American linen buyer. The bank has merely been an agent in between. Of course the bank is not in business for its health either, and it gets a slight commission for services from both the exporter and the importer.

On the other side of the Atlantic a similar drama is being enacted. The English wheat buyer who sent his bill of exchange to America had to buy it from a bank. He has paid for it, say, £206 (the equivalent in gold weight, of $1,000), and the bank can sell it to him because it expected someone to come along who had sold goods to the United States and would have an American credit for $1,000, or the equivalent of £206, that he wanted to turn into cash in England. And sure enough, along comes the Englishman who has sold linen to America and wants to know whether the bank will buy his claim on America. The bank is only too glad to buy the claim, for it has already sold one that it did not have. The bank has already obtained from the English wheat buyer the money to buy the claim.

Foreign exchange is in essence and purpose a process of settling international claims on your own side of the water. The only things that have crossed the Atlantic in this four-cornered transaction (if we leave the banks out of it) are bills of exchange. No money has crossed. Money has changed hands only within both America and England.

Of course it is not likely that the transactions of one individual and the transactions of another will equal each other so exactly nor is it likely that these persons will go to the same bank. But as sales do normally equal purchases over the long run, and as banks can utilize their own funds for certain periods, and as they do not have to sell the same bill that they buy, because it represents a credit against which they can draw as they choose, these things all cancel and balance each other within the respective countries.

All this is what happens when everything is going normally, as it should be going. But that is not so today. England and all the other leading European countries want a lot of our goods, and can spare few goods to sell us in return. What is the result? American merchants who have sold goods abroad keep coming to our banks to sell their claims on London. They want the banks to give cash for them, and what they offer in exchange for this cash is what they call a bill of exchange, which is a credit on some center in Europe, say, London. Now the only reason that banks ever want to buy credits on London (unless London offers a higher interest rate than New York) is so that they themselves will be able to sell bills of exchange against the credits. But few people are asking for credits in London because few people have bought goods from England, and consequently there are few payments to be made in England. The result is that the credits held by Americans in foreign centers keep piling up. Banks become reluctant to buy any more credits on London. The only way merchants can induce them to buy the credits is by offering them below their ordinary exchange value.

But as the credits in London keep on piling up, and as the banks are asked to part with more of their own cash to buy something that they do not want, the bills must be offered more and more below their ordinary exchange value in order to be taken. Hence we have a steadily increasing "discount" on the different foreign exchanges. When some man who has bought goods in England actually does come along to buy what he calls a sterling remittance, and what the bank thinks of as part of its credit in London, the bank is glad to sell it and it will offer it at practically the same discount that it has itself been able to get it. Even if the bank did not do this of its own free will, the competition of other banks in the same position would force it to. Over in England again, there is such a scarcity of American

credits and such a voracious demand on the part of Englishmen who want American credits in order to pay their bills here, that the banks are able to charge a premium, and we say that the dollar is at a premium in London.

But what is the effect of all this? We know that it cannot go on indefinitely. And look at the effect meanwhile of the rates themselves. The Americans who are selling to Europe are getting less and less for their credits in London, and that is cutting more and more into their profit. The Englishmen or Frenchmen or Italians are paying more and more in order to effect payment in America. It is getting to be too expensive to buy goods here. Meanwhile those here who buy goods from Europe are getting them cheaper and cheaper; those in Europe who sell goods to America are getting the benefit of the premiums that the European buyer has to pay them for their claims on America. The ordinary tendency would be to raise our imports and lower our exports. But if Europe hasn't the goods to send us, the result will be to bring our exports down to our imports.

If that is allowed to happen, then our astonishing export trade, a leading source of our prosperity in 1915 and 1916 and a leading source of it now, would shrink again. Business would suffer. Unemployment would set in. And Europe would suffer more than ourselves, for it desperately needs our goods; industry has not recovered from its prostration and in many parts people are starving.

The one remedy is to extend credit to Europe, so that Europe can buy our goods. We can do this by buying European stocks and bonds. Bills of exchange are drawn against these securities as they are sold just as if they were merchandise, and a credit to Europe temporarily takes the place of its own value in goods.

And that is where you and I come in. This credit cannot be extended by banks. The banks are the biggest debtors in the world. The $260,000,000 of deposits in The Mechanics & Metals National Bank is not the amount of money that it has, but the debt that it owes, and the same is true of the deposits in any other bank. Most of this debt is payable on any day or any hour of the day from ten to three that the depositors may take it into their heads to ask for it. Consequently it is not good banking practice to make loans running for more than a few months at a time. And the money that we lend to Europe will be needed for several years. So you and I, if we want to see business prosper in this country, will do what we did during the war when we took Liberty bonds. We will extend credit to Europe; we will buy European securities, or securities backed by European securities, as soon as the financial leaders here have worked out a plan for us that will protect us fully and will be operative on a grand scale.

The H. & B. American Machine Company, Pawtucket, R. I., is sending out to its customers and friends a calendar for the year 1920 which in addition to containing the calendar pad for the year, has a photograph of the works of the company on the top of it.

The Lovingood Company, agents for shipping room supplies, Atlanta, Ga., is sending out a calendar for the new year to the trade. This calendar contains a panoramic view of the city of Atlanta as well as an advertisement of the Lovingood Company.

Georgia Industrial Council.

At a meeting of the presidents and secretaries of twelve industrial associations in Georgia in the offices of the Georgia Manufacturers' Association in Atlanta on January 15th, the Georgia Industrial Council was organized for the purpose of securing closer cooperation on the part of all the industries and industrial associations of the state. D. A. Jewell, president of the Crystal Springs Bleachery Company, Chickamauga, Ga., and the Cotton Manufacturers' Association of Georgia, was elected temporary chairman of the council and Edward A. Kimball, secretary of the Georgia Manufacturers' Association, Atlanta, was elected temporary secretary. The next meeting of the council was scheduled for February 10, at which time the committee appointed by Mr. Jewell to draft a form of organization will make its report and a permanent organization be effected.

The Veeder Manufacturing Co., Hartford, Conn., is sending out its Catalog No. 1901 which contains photographs and full descriptions of all types of "Veeder" counters, as well as prices. It is a 52-page booklet printed on good quality stock. The textile counter section is of unusual interest to mill men, as it contains descriptions of counters designed especially for textile machines which include the new model loom pick and loom yardage counters, as well as bank counters. All these new models are large in size. The figure-wheels indicating the machine-output are large and legible and the mechanism is heavy and durable, which is important with the two former due to the tremendous vibration of the modern loom. The pick and yardage counters are of a new design and are unlike any other counter, being designed for loom work and not being an adaptation of an all around counter built for general machine use. The other textile counters shown in this section of the catalog are adaptations of "Veeder" models for general machine use and are said to have ample durability for their respective purposes.

The Mechanics & Metals National Bank of the City of New York has issued a booklet on the Edge Export Finance Act, giving the text of the measure and the text of the McLean-Platt Act, together with a short explanation. In its foreword to the booklet the bank says: "The authority now exists which provides the machinery for large grants of credit to Europe. The extent to which it will be taken advantage of remains to be seen. Banks will hesitate to invest in such corporations unless they feel that the investing public, in its turn, will purchase the bonds issued by the corporations. Perhaps the most effective plan would be the organization of one or a few great corporations large enough to handle the problem on the great scale that it must be handled, well known nationally, backed by interests well known enough and managed by men of such reputation as to command the utmost confidence of the country."

The J. Spencer Turner Company, 56 Worth Street, New York City, is presenting its customers and friends with a holiday souvenir in the form of a handsome ash tray and match holder, which is made of metal.

Manipulation of Short-Fibered Cotton*

BY L. A. PORRITT.

The term "short fiber" has presented a difficulty in arriving at the dividing line where medium ends and short begins. The better grades of Indian cotton are successfully treated on the usual cotton system, in England to a small extent and to a larger extent on the Continent, but generally in India and Japan with modifications as regards the diameter of the drafting rollers in the drawing, speeder frames and the spinning machinery. To describe such a plant would be of comparatively little interest. I have, therefore, decided to deal with the shorter grades of Indian, Chinese and Asiatic cotton, say with a staple of 5/8 inches and under, as giving scope for a paper to describe a system which is rarely seen in operation in Lancashire.

The objects of this paper are to describe the process of treatment best suited to the conversion of short-fibered cotton into a weft or filling yarn, and to place before manufacturers the possibilities of trade in the weaving of cloths where such a weft is suitable, and also to demonstrate that there is an opportunity for development in this country in the better use of short-stapled cotton grown in our own Empire.

For a good many years past, I have felt that the treatment of short-fibered cotton was being neglected in this country, and here, it may be stated, is included "soft" cotton waste, as the two are closely allied in length of fiber and can be blended in the mixings. No doubt there is a reason for this neglect. We have specialized in the treatment of medium and long-stapled cottons—American and Egyptians—and Lancashire has built up an industry to such an extent that her yarns or cloth, or both, are exported to every known corner of this hemisphere, and no country, I am sure you will all agree, can beat us in quality of product. As a proof of our superiority, those present tonight who are cotton spinners will know that, owing to long experience, careful study by the management, and superior skill of the workers, equal counts spun in Lancashire are from a shorter staple or lower grade than the like counts spun in the United States and other countries. I have seen this for myself, and have noted, also, that the waste, in proportion to the output of the mills, is higher in the mills of America and other countries than it is here.

What has been achieved in the medium and long-stapled cotton encourages one to believe that a similar position in the short staples can be obtained, provided our spinners and manufacturers can be persuaded that it is a business-like proposition. It would appear that, in order to install a new business successfully, there must be cooperation between the spinner, manufacturer, dyer and finisher, and merchant. It is useless to spin a yarn if the manufacturer will not weave it, or the dyer and finisher is not disposed to print, dye and raise or finish the cloth to suit the market which the merchant has to cater for.

The bulk of the short cotton is grown in India, and the Government wants us to utilize it to a far greater extent. The cotton waste is produced in our mills and, instead of the latter being mostly exported to the Continent as formerly, why should we not try to build up a new industry and become pre-eminent in all the branches of the cotton trade?

There is another important factor to be considered, viz.: that prices of raw material have risen to a very high level during the war. As there is every appearance that they will continue to be high, it behooves us to find out whether cheaper grades of cotton cannot be utilized in the manufacture of cloths so as to meet the lower purchasing power of the people. Firms who can make a good article out of a cheaper cotton may have the greatest success in the future. Continental firms, particularly those situated in Germany, Austria, and Belgium, have given very close study and have had almost a monopoly of the trade in short-fibered cotton.

India yields approximately 4,500,000 bales of Indian cotton, and it is stated in Prof. John A. Todd's book, "The World's Cotton Crop," that the Indian exports in 1912-13 were 2,065,000 bales of 400 lbs. each, of which the United Kingdom took 4.1 per cent; Japan, 48.6; Germany, 12.8; France, 4.4; Belgium, 11.7; Austria, 5.3; Italy, 7.9; Spain, 1.1; rest of Europe .6 per cent. No statement is made, however, of the proportion of the short staples exported—such as, say, Scinde, which is given as 3/8 to 1/2-inch staples; Bengal, 1/2-inch to 5/8-inch; Cocanada, 5/8-inch; Goghari, 1/2-inch; Rosea, 3/8-inch to 5/8-inch; Punjab, Hausi and Multan 5/8-inch—as compared with the longer staples. It appears, moreover, that Belgium consumed the largest proportion per spindle, barring Japan, viz.: 63.2 pounds. Italy consumed 14.1; Germany, 9.2; Austria-Hungary, 9.0; France, 4.9; Spain, 4.4; United Kingdom, .6, and Japan, 146, while India retained 266.2 for her own consumption. I have made inquiry from the Indian Trade Commissioner and he states that out of a total Indian crop of 4,600,000 bales of 400 lbs. each the staple of 3/8 to 1/2-inch is represented by about 370,000 bales, 1/2 to 5/8-inch by 600,000, and 1/2 to 7/8-inch by 1,200,000. All of the last named is mixed and a large proportion of it would run from 1/2-inch to 5/8-inch. Before the war, Germany took about one-eighth of the total Indian exports, while the United Kingdom took less than one-third of what Germany took, and the bulk of the cotton sent to Germany would be of the shorter staples.

I have in mind a mill, near M. Gladbach, which was well equipped with machinery, and samples of the yarn and cloth made from the yarn spun at this particular mill may be now examined. The short cotton is only suitable as a weft yarn, and the main object would be to obtain a full and round thread. The "condenser," or modification of the woolen system is, therefore, the one universally adopted.

One of the leading machinery firms very kindly prepared for me a plan of machines such as they advise for treating about 25,000 lbs. a week. It consists of hopper bale opener, delivering by lattice to a hopper feeder coupled to a porcupine opener, and this to feed into a Crighton opener or not, by means of a by-pass according to the amount of dirt, shell and leaf in the cotton, thence through dust trunks to an exhaust opener, with beater and cages, into a hopper feeder, delivering to single Buckeye opener combined with single beater scutcher and lap machine. The

*Extracts from a paper read before the Lancashire Section of the Textile Institute.

laps are then taken and doubled on two finisher scutcher lap machines. The delivery would be in the form of laps, if for carding engines 48 to 50 inches wide, and by a lattice delivery if for 60 to 70 inches wide, or if the raw cotton requires to be dyed. On the Continent the general custom is to put down the wider widths of carding engines. Carding is operated on the two-card system known as breaking and finishing. To the former is attached an auto-hopper feeder, adopted in nearly every woolen mill today. The material is carried upward by the spiked lattice and, after the requisite amount is deposited in the scale pan, the latter opens at regular intervals and allows the cotton to fall onto a lattice feeder and then passes through feed rollers to one, or, in some cases, three takers-in.

The carding engine is of the usual roller and clearer type which, in order to get a wooly or oozy effect, has proved to be the most suitable. Careful attention is paid by the makers to prevent loss of dust escaping into the atmosphere, by means of adjustable disc plates which fit up to the openings in the covers over the roller and clearer necks. The bearings of the rollers and clearers are of the spherical type and project into the ends of the rollers and clearers, thus reducing the roller laps to a minimum and providing an easy running bearing with a small supply of oil. The rollers are frequently of 7 inches diameter and the clearers are about 2½ inches in diameter and are run at a high speed. The cover over the "fancy" has had special attention, as, owing to the speed of the cylinders being 140 revolutions a minute, unless the air space around it is confined, there would be a large escape of dust. A small clearer is placed between the cylinder and the doffer, usually covered with filleting and run about two revolutions for one of the doffer, which serves to prevent loss of fiber which otherwise would fall on the ground from the action of the quick cylinder and surface speed as compared with the doffer. The undergrids are very stiff and can be accurately set. At the delivery of the breaking card is fitted a parallel fiber feeder. The finishing carding engine is much on the same lines, but is provided with a leather tape condenser. There are two, three, or four heights of bobbins according to the gauge of the mule or frame. The particular set of engines in this mill were 71 inches wide, with 140 threads with 4 bobbins of 35 threads and 2 waste.

Many present will probably shake their heads at the "tape" condenser and think it is too complicated as compared with the ring doffer type. I fail to see how the very short-stapled cotton or waste can be either treated or produced, for counts, say, 4s to 8s, bearing in mind that output must be studied, excepting by the tape condenser type. The bobbins are then taken to the self-acting mule known as the "condenser" mule in this country, and which spins a yarn known on the Continent as the "two-cylinder."

For those who are not familiar with this type, it will be as well, perhaps, to explain where the chief differences arise between the ordinary cotton self-actor and the one used on the condenser system. In the former, the creels for the roving bobbins are replaced by horizontal surface drums, about 9 inches in diameter, which serve to unwind the condenser bobbins. In place of three lines of top and bottom rollers, where the drafting takes place for cotton, there are two lines of bottom-fluted rollers, one inch in diameter, and one top roller, one inch in diameter, covered with leather, and the draft is obtained between the spindle and the roller; the amount of draft is usually about two to one for clean material and less for lower quality. This accounts largely for the level yarn produced, as the carriage draft acts on a long length of yarn, and as any twist inserted at the spindle point immediately tends to run into any thin places there may be, the thicker places are left comparatively soft and thus susceptible to the drafting action of the carriage.

The "condenser" mules, for counts of, say, 4s and above, are fitted with a treble spindle speed in order to give increased production and a superior quality of yarn. The first speed of the spindles is about 1,800 revolutions for 18 inches of the draw; then the second speed is accelerated to 2,700 revolutions until the carriage is nearly at full stretch, and the third speed is about 5,000 for twisting up. There is also a motion to deliver about ¾ to 1 inch of yarn before the carriage starts away from the beam, in order to prevent the yarn being overstretched, for the short length of yarn which has been well twisted during the conclusion of the preceding draw is thus softened and put into a condition to allow of its being easily drawn. These are the principal differences which together have engaged considerable thought, on the part of our machine makers and spinners, before the mule as it stands today became so well adapted for its work.

When spinning 5s to 6s, the carriage will make about 4½ draws a minute; for 7s to 8s, just under 4 draws. Production will be, say, 5s about 4¼ lbs.; 6s about 3½; 7s about 3, and 8s about 3¾ lbs.

While the spinning process is under consideration, I should like to draw attention to the patent ring-spinning frame for short cotton and waste as made by Platt Bros., Ltd. It is an improvement on the machines made for many years back by Celestin Martin, and Societe Vervitoire, of Verviers, Belgium, and Josephy's, Erben, Austria. In many countries, there is a great objection to self-acting mules, owing to the difficulty of obtaining suitable labor. It is only recommended where comparatively clean material is to be treated as regards husks and leaf. This type has not made much headway on the Continent in the spinning of weft yarns, but it is worth consideration where ooziness is not of such importance, and where there is a strong objection to mules. It is found to be more suitable for China, as the cotton is generally of a clean character. This ring-spinning frame is constructed with a surface drum to unwind the condenser bobbin; the threads then pass through a pair of delivery rollers, 1¼-inch fluted bottom and 2⅛-inch top plain, on through a twisting tube to the drawing, 1¼-inch front fluted and 1⅝-inch back pressure, covered with leather and lever weighted rollers, and from these to the ring and onto the bobbin in the usual way. The draft between the delivery and drawing rollers is constant, and is from 1½ to 2, depending upon the quality of the waste or cotton, and the process of drawing is materially assisted by the twisting tube which imparts a false twist to the roving and by means of two pegs on the top of the tube also agitates the roving during the drafting. As showing what is being developed here, I may say that "condenser" bobbins are being taken direct to an ordinary ring-frame fitted with small diameter drafting rollers, and here a very good result can be obtained where strength rather than softness or fullness is of importance. Production on 10s counts is about three pounds per spindle.

I propose to refer only briefly to the processes of dyeing, finishing and weaving. Where colored yarns are re-

quired, the common practice is to dye in the raw material. On the Continent I have seen several different colors being treated in the card rooms at the same time, and the adoption of the automatic feeder to the breaker carding engine lends itself to this arrangement. The process of dyeing in the raw state is simple, and there are several machine makers who specialize in this connection. The dyeing machine consists of a cistern provided with a centrifugal pump, the suction and delivery of which are connected to the underside of the cistern. Inside the cistern, and over the delivery of the pump, is fixed a conical seating, upon which rests a perforated cylinder containing the material to be dyed. The cylinder is formed of an inner and outer perforated casing, between which the raw cotton is packed, the material being held tightly in position by means of a lid forced down by a screw. The dyeing of the material is effected by the continuous circulation of the liquor through the cistern.

With reference to the weaving, the cloths are mostly plain woven. Some. however, are woven on Jacquard looms in order to obtain the figured patterns. You will probably agree that there is room for improvement in design in this country even when treating cloths woven from short-stapled yarns. Several of the cloths are double woven, which, I understand, throws up the weft, so that the raising machines can act on the weft to the fullest advantage. Most of the cloths are raised on a 36-roller machine and then finished on another 24-roller machine.

Questions might arise as to the cost of the plant as described, the cost of labor, loss in working, etc., to produce these cloths. I have not gone into these questions, mainly for the reason that values of raw material are changing from day to day, and labor costs are also subject to frequent changes. It seems to me that the best course for any firm which might contemplate launching out into a new venture, would be to first of all decide on the yarn or cloth to be made, and then apply to one or another of the machine makers, who would be only too willing to give the necessary information.

Cotton Fabric Designs.

BY J. W. K.

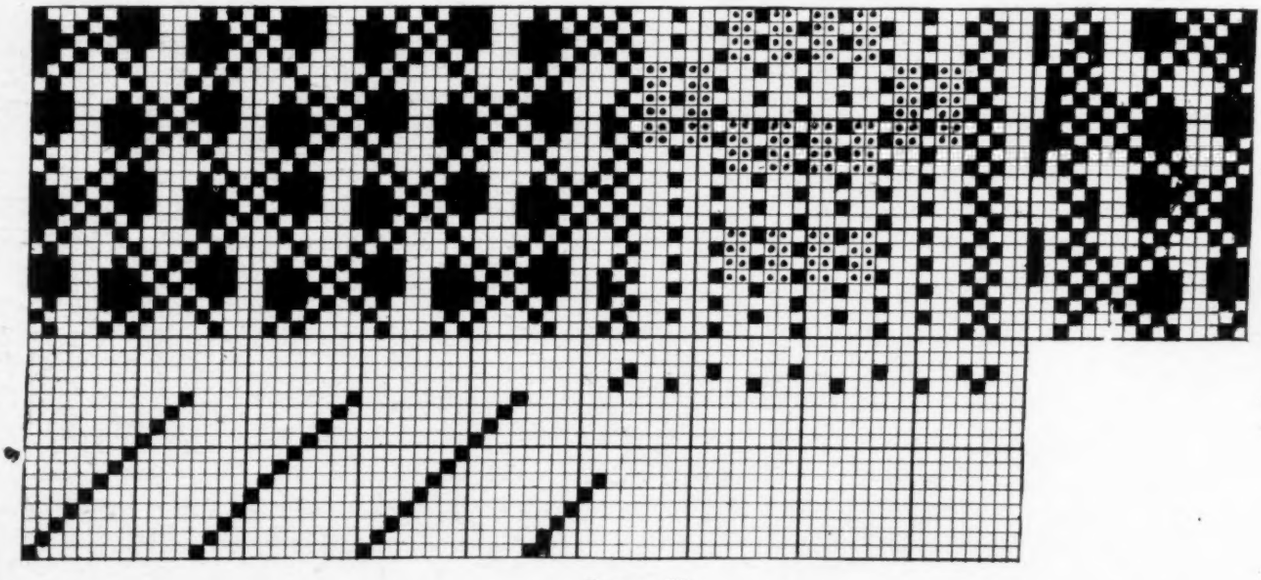
Design H is a style of dress cloth. The ground weave is a kind of "honeycomb" which is very effective. The particulars for production are: 28 dents per inch, 2 and 3 dents per inch according to patterns, 64 picks per inch, 18s rove for the weft, 32s American for the ground and 2/40s American for the figure stripe.

The warp is usually made 31 inches on the reed for 28½-inch cloth, 74 yards of warp on the large beam, 70 yards on the small beam = 70 yards of cloth. 28 dents per inch × 31 inches wide = 868 dents in the reed. It would improve the weaving to have the chain of figure threads on the small beam and the ground threads on the large beam. The warping plan is as follows:

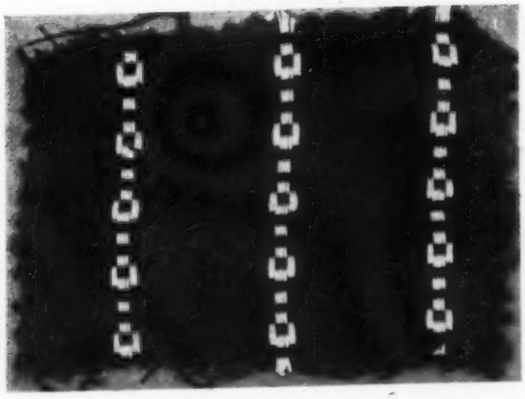
44 threads black (32)	= 22 dents
2 threads white (2/40) and 1 thread black (32)	= 1 dent
21 — 7 times above	= 7 dents
2 threads black	= 1 dent
70 threads per pattern and	31 dents per pattern.
28 patterns	= 28 patterns
1960 threads in warp and	868 dents in warp

To find the number of threads on the two beams, multiply the threads per pattern by the number of patterns. 54 threads black per pattern × 28 patterns = 1512 threads (32s) on the large beam. 16 threads white per pattern × 28 patterns = 448 threads (2/40s) on the small beam. 1512 × 74 ÷ 840 × 32 = 4.16 lbs. of 32s. 448 × 70 ÷ 840 × 20 = 1.86 lbs. of 2/40s. 64 × 31 × 70 ÷ 840 × 18 = 9.18 lbs. of 18s weft. 4.16 + 1.86 + 9.18 = 15.20 lbs = total weight of warp and weft for 70 yards of cloth. 70 yards cloth ÷ 15.20 = 4.6 yards per lb.

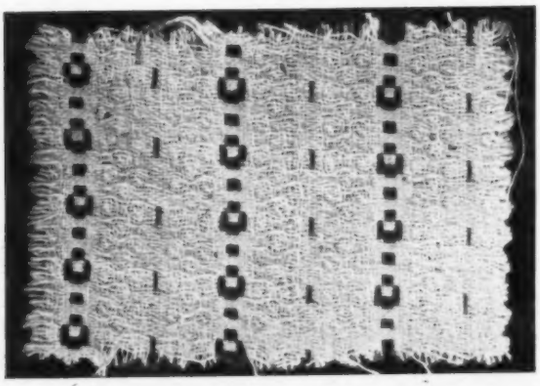
In this class of goods colored grounds, such as blue, black, brown, dark and light green, pink, heliotrope, red,



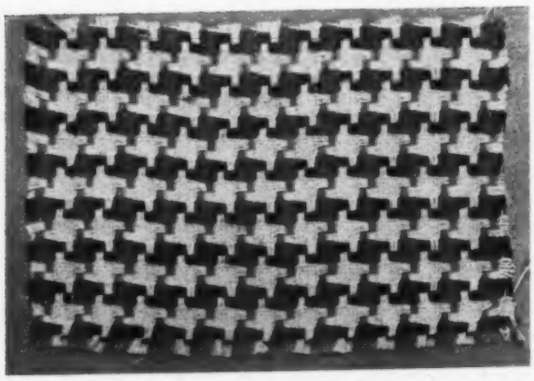
DESIGN H.



PATTERN H.



PATTERN I.

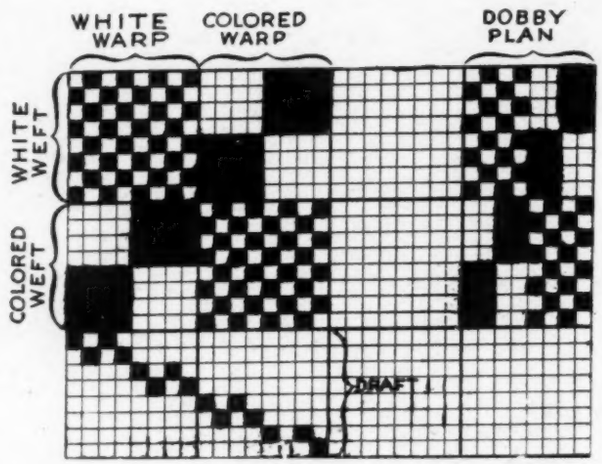


PATTERN J.

sky blue, etc., are desirable with stripes of white and colors as given suitably used.

Design I is made from the same counts of yarn, etc., as Design H and is given to show the manner in which other designs with light grounds may be produced. Very light shades of slate, cream, sky blue, black and white are desirable for grounds, with the introduction of matt weaves in addition to the figured chain stripe. After weaving, this class of goods has a "nap" raised on the back side of the cloth only, giving a full feel to the cloth. No other finishing process is necessary so that the cloth is, with the exception of raising, sold in the loom state.

Design J is a neat check effect suitable for ladies' dress goods. It is made in light and dark grounds to the following particulars: 32 dents per inch, 2 threads in one dent, 22s ring warp, 64 picks of 20s ring and 2/40s mercerized weft per inch. The cloth is woven 32 inches in the reed for a 30-inch cloth, 72 yards of warp for 68 yards of



DESIGN J.

cloth length. The particulars are 2304 threads × 72 yards long ÷ 840 yards per hank × 22s count = 9 pounds for 74 yards of warp. 64 picks per inch × 68 yards of cloth × 32 inches wide in reed ÷ 840 yards per hank × 21s average count = 7.84 pounds of weft. 9 lbs. of warp + 7.84 pounds of weft = 16.84 × 4 yards per pound = 67.36, which is 68 yards of cloth in the nearest even figures.

In the warping pattern, 8 threads of sky blue 22s + 8 threads of white 22s = 16 threads per pattern. In the check pattern, 8 picks of given mercerized 2/40s + 8 picks of white 22s = 16 picks per check.

An attractive calendar for 1920 is being sent out to the trade by the Whitin Machine Works, Whitinsville, Mass., manufacturers of textile machinery since 1831. This calendar is made with durable cardboard for a back and the front is illustrated with a lithographed design. In this front are two openings. Inside the calendar are twelve separate sheets. On each is the calendar for the various months of the year and also views of the Whitin plant and some of the machines manufactured there. The calendar is seen through the lower opening in the front and the views through the upper, giving the entire calendar an attractive appearance.

Lockwood, Greene & Co., engineers, Boston and Atlanta, are sending out to their clients and friends a beautifully finished calendar for 1920. This calendar has a separate sheet for each month in the year and on each sheet is a reproduction of a building designed by Lockwood, Greene & Co.

By a clever modification of the first word in its name, the Atlantic Dyestuff Company has evolved a series of names which it has adopted to denote the various colors it now produces; for instance, it uses "Atlantic" to denote sulphur colors; "Atlantamine" to denote direct colors; "Atlantene" to denote developed colors; "Atlantole" for acid colors, and "Atlanthrene" to denote chrome colors.

The National Aniline & Chemical Company, Inc., announces the production of two new basic colors, known as Methyl Violet 5 B and Fuchsine N B. The tinctorial value and solubility of these dyes will prove especially serviceable for the dyeing of leather, silk and paper, also for cotton and silk printing.

The Finishing of Pocketings

BY WILLIAM B. NANSON.

The finishing of a piece of cotton cloth is one of its most important features and has the widest influence on its salability, in fact, more so than even the quality of the yarn used in its production or the perfection of the weaving. The finish strikes the eye of the would-be purchaser and the feel appeals to his sense of touch and a good feel and finish will sell a poorer quality of cloth in preference to a better quality with a poorer feel and finish. Finishing may therefore be said to take the most important part in the round of operations necessary to the production of merchantable cotton cloth.

We have seen expensive finishing machinery installed and put into the hands of men whose only experience had been in an ordinary cloth room in a cotton mill, men with no knowledge of finishing at all, men who can run a calender only one way (and that usually the wrong way) and have the knowledge of the fact that a score or more of entirely different finishes can be gotten from the same calender by varying the manner of threading, the pressure, the temperature, and the amount of condition or moisture in the goods.

As a matter of fact, we once knew a so-called "finisher" who ran an expensive seven-bowled calender backward for several years even though he continually experienced difficulty of entering his end of cloth under the bottom roll and round to the first nip at the back, which required the services of two men. It never occurred to him that the calender was running the wrong way. As a matter of fact, he had had no experience with calenders and did not know any better. Imagine the placing of the reputation of a mill in the hands of a man like this!

In all plants where finishing is done, the finisher should be the "top hole." He is not only one of the most important men in the plant but he is usually one of the highest paid men. He should be thoroughly capable of giving the goods any kind of a finish required, and we may say here that the variety of finishes which can be given to cotton cloths is practically unlimited. We might say further that with the regular standard finishes no hard and fast rules of procedure can be laid down, for no two finishers can produce them by precisely the same process, and there will be slight, almost imperceptible, differences in the cloths themselves.

Moreover, it is most difficult to describe on paper all the ins and outs of any particular cotton finish for words cannot convey to the reader all the small differences in feel and appearance which go to distinguish one kind of finish from another. It is comparatively easy to speak of a finish being a "hard finish," or a "soft finish" or a "bright finish" or a "dull finish" but it is not so easy to convey to the mind of the reader all those subtle graduations of finish which lie between "hard" and "soft" and between "bright" and "dull."

In this article we are going to confine ourselves to the finishing of pocketings and their kindred cloths and finishes, such as sleeve linings, etc., and in giving the descriptions of the characteristics of the different finishes, we shall endeavor to make ourselves as lucid as possible, although as we have already stated, the art of finishing cannot be conveyed in words or by following mere formulae alone, yet the consideration and analysis of published formulae may afford a means for the exercise and development of inductive reasoning on the part of the finisher which is a most important faculty toward helping to solve the many nicer problems involved in finishing cotton goods.

Pocketings and kindred goods may be either bleached or dyed but in all cases the goods must be finished strong and feel full and leathery. Tender goods will never do for pocketings and linings. For this reason we advocate the usual caustic bleach; that is, steep over night in hot water (or diastafor), sour in hydrochloric acid, wash and boil 6 hours in a 2 per cent mixture of 60 per cent caustic soda and 40 per cent soda ash. Wash and sour from this. Wash and chrome, sour, wash, mangle in hot water, and dry up.

There may be cheaper ways of doing this bleaching but we do not advocate them.

Following is an example of a first-class bleached pocketing made and finished in England: The goods were 33 inches wide in the grey and the counts were 76 x 60. The weight was 4.10 yards to the pound and the finished width was 31½ inches.

After bleaching and mangling as above and drying, the cloth was allowed to cool. It was then conditioned on the damping frame or sprinkler and allowed to lie for a short time to condition. It was then swiss calendered on a 5-bowled calender using a light pressure with warm metal bowls. This was to close up the threads and smooth up the cloth. The goods were then filled on an ordinary 2-bowled compound lever starch mangle, using a 10-pound weight on each lever with the following mixture:

White Dextrin	200 pounds
Corn Starch	80 pounds
Oleine Oil (50 per cent)	7½ gallons
Carbolic Acid	½ pint

Blue to shade.

Water sufficient to make, when boiled, 100 gallons was added and boiled for 15 minutes.

After starching the cloth was stretched on a clip tentering machine. It was then dried on the cans and allowed to cool off. Afterward, it was well conditioned on the sprinkler and allowed to lie for two hours. Then the cloth was swiss calendered cold on a 5-bowled calender having cotton bowls only, using heavy pressure, after which it was again stretched on a belt stretcher to 31½ inches. This made a good looking cloth with a dull, full, heavy, leathery finish.

The reader will note the care and infinite trouble taken by the English finisher to get this finish right and when it is done it is a credit to the finisher. This finish is perfect and permanent, it will not all break up and feel like an old rag before it is worn a week.

We also give here an ordinary American pocketing: 33 inches wide in the grey. The counts were 66 x 56 and the weight was 4.30 yards per pound and the finished width 30½ inches.

These goods are bleached and mangled hot and starched without drying with a mixture of 130 pounds of corn

starch and 100 gallons of water (blue to shade). Boil and cool down to 140 degrees F. and add 4½ pounds of diastafor. When the starch is liquified, add 60 pounds of china clay in 100 gallons of water. Boil all up together and add 10 pounds of stearine soap previously dissolved. The stearine soap is made as follows:

Stearine	7 pounds
Caustic Soda at 36° Be.	2½ pounds
Water	7 pounds

Boil together for ½ to 2 hours and this should give a white, compact soap.

This starch is applied on an ordinary 3-bowled starch mangle. The goods are dried, cooled off, conditioned on the damping frame, laid out for two hours and then calendered on a 5-bowled calender cold.

The reader will note the rough and ready character of this method as compared to the English way of doing it. This latter finish will not begin to compare in permanency, feel or appearance with the English finish, although it is much more quickly done.

A very nice pocketing can be made by starching on the back filling machine. In this case the goods are bleached, mangled and dried, then starched on the back only with starch and clay, dried and cooled off, conditioned and heavily calendered, cold, on the 5-bowled calender. It may be taken as a rule that the finer the cloth, the less china clay and mineral (sulphate of lime) are used and the mixing is made thinner by adding water, for the writer has found that for back filling purposes when the excess starch is scraped from the cloth by a doctor, the starch works better if mixed and boiled much thicker than desired and then reduced to the necessary consistency by the addition of cold water. China clay is used when bright finishes are required and mineral is the better adapted when a dull finish is wanted.

No very definite instructions can be given as to the weight or pressure that should be applied on a mangle, either water or starch, for producing any given result. This is governed by many factors, such as the size of the mangle, the weight and condition of the bowls, the kind of bowls in use and the varying local conditions. All this must be left to the judgment of the finisher. Then again, the quality of the goods and the amount of stiffening which has to be given and the kind of stiffening mixing used, all have an influence and make it almost impossible to give any more definite amounts of weight to be used than we have already done.

In regard to the starching we may say that the greater the pressure on a starch mangle the less stiffening there is put into the cloth, but the heavy weight causes this stiffening to penetrate into the substance of the cloth and it does not show itself so much on the surface. The lighter the pressure the more weighting can be given to a cloth.

A great deal of the evenness and beauty of a finished piece of cotton cloth depends upon the care with which the mixing has been made and there has been much divergence of opinion and practice among finishers regarding the best methods of procedure. It is only necessary to say that the mixing must be perfectly homogeneous, that is, each and every ingredient must be thoroughly well mixed and incorporated with every other ingredient. When we use such diverse substances as starch, china clay and fats that have a natural tendency to separate, it is by no means an easy task to obtain a perfectly homogeneous mixture.

The starch size should always be prepared first. After the cold water has been run into the mixing tub the starch should be thrown in and the steam turned on. In nearly every case it is better to boil the starch with live steam blowing directly into the mixture. This keeps the mixing in agitation and largely contributes to the production of a more perfectly blended mass.

After the starch has become boiled, or at whatever the finisher considers the right temperature, some boil it and some start start when the temperature is 150 degrees F. to enter the other ingredients—first any soap or oily softenings, then any waxy matters and after this any glue size, mixing well by constant stirring and agitation by means of the live steam used in the boiling. Finally add any filling such as china clay or mineral and the chlorides of zinc and magnesium or other soluble bodies if such are used.

The consistency of a stiffening depends upon the length of time it is boiled and care must therefore be taken to always boil a certain mixing the same length of time. The longer starch is boiled and the thinner it becomes owing to the condensation and any extra time given to the boiling makes a difference in the finish.

Finishers should keep china clay and mineral in the form of paste as being more convenient to add to the mixing, though they are used occasionally in the dry state if no friction is going to be used either on the starch mangle or the calenders.

The tinting constituents of a mixing are always added last, such as bluing for the whites and the coloring matters for the dyed goods.

Dyed Pocketings.

The following is the method employed in England for the finish of black pocketings:

The cloth is 38 inches wide in the grey; the counts are 76 x 68 and the weight, 5.40 yards to the pound; the goods finish 36 inches wide.

After dyeing and mangling the cloth is dried on the cylinder dryer and then filled on a victoria mangle or other suitable starching machine with the following mixture:

Corn Starch	60 pounds
Wheat Flour	40 pounds
Mineral Black	70 pounds
Barytes	50 pounds
Bone Grease	12 pounds
Hermatine	10 pounds
Acetate of Iron	1 quart
Sulphate of Copper	1 ounce
Bichromate of Potash	1 ounce
Carbolic Acid	½ pint

Water sufficient to make, when boiled, 100 gallons is then added. Boil 10 minutes.

After starching once the cloth is dried and again starched with the same mixture; then dried and allowed to cool. the seams at the joining of the pieces are then cut out and the ends pasted together. The cloth is then conditioned on the damping frame and allowed to lie for two hours, after which it is calendered on a dead set friction calender using heavy pressure and a high temperature. It is then stretched on the belt stretcher and again passed through the friction calender. This finish is leathery with a high gloss.

Another style of English finish is as follows: The cloth was 41 inches wide in the grey; the counts were 76

x 48 and the goods weighed 6.66 yards per pound and finished 39½ inches wide.

The goods are dyed black, mangled, dried and starched twice the same as the previous recipe. After drying they are cooled off, conditioned on the damping frame and allowed to lie for two hours. They are then calendered once heavily on the heavy friction calender at a low temperature and then stretched. After being stretched they receive two more runs on the friction calender with a light set and a low temperature. They are then passed over the dry cans to dry out all superfluous moisture and also to deaden the finish. This is a dead finish, thick, leathery and full.

We would say here that all dyed pocketings must be dyed with colors that will not bleed. This is especially necessary in the case of blacks. Cheap loose colors will not answer. One of the more popular systems of dyeing a good clean black on pocketings is as follows:

The plant consists of a stock tank for the logwood liquor and a logwood two-box dyeing machine, drying cans connected with the dyeing machine, a stock tank for the chrome liquor and a two-box chroming machine, a steam box, a mangle and a washer.

The goods are entered dry into the logwood bath and run continuously through the first and second box and over the dry cans, being immersed twice in the logwood liquor and squeezed twice from the liquor and then dried up all at one operation.

The goods are then taken from the dryer and chromed and squeezed twice in another two-box dyeing machine and steamed or aged continuously, the steamer being connected with the chroming machine.

The goods are then washed thoroughly in another two-box dyeing machine and mangled, dried and finished.

The speed of the machines is usually about 45 to 50 yards per minute or 3,000 yards per hour but a speed of 75 yards per minute may be attained on some goods or 4,500 yards per hour. The logwood stock liquor, which is used full strength at nearly boiling point—though the writer thinks it may be used nearly cold—is made up with 125 gallons of water, 110 pounds of 51 degree logwood extract and 5 gallons of acetic acid. The chrome liquor is made up with 125 gallons of water, 49 pounds of bichromate of soda and 3 pounds of soda ash. The time of steaming should be about 10 seconds.

The foregoing makes a good, fast, clean black that is in wide use and that will not stain white when hot pressed as linings often are, but, like all chrome blacks on cotton, it will not stand the test of time and will slowly oxidize and turn brown (if not tender) if it is kept long enough.

If a jet black is required or if the preceding black is too blue, the addition of a little quercitron bark extract to the logwood liquor will make it all right.

Slate and other light colored pocketings and sleeve linings can be starched and dyed and dried at one operation on a two-box dyeing machine having special heavy squeeze rolls connected with a set of drying cans. The formula is as follows:

Dextrin .....200 pounds
Corn Starch ..... 80 pounds
Soluble Oil .....7½ gallons
Color to shade. Water sufficient to make, when boiled, 100 gallons. Boil for 15 minutes; or

Corn Starch .....150 pounds
Color to shade
Water, to make .....100 gallons

Boil and cool down to 140 degrees F. and add 6 pounds of diastafor and stir until liquified. Add color after liquification always.

After starching and drying these goods are to be conditioned and calendered into any finish bright or dull that may be required.

Goods requiring china clay or solid weighting material in them cannot be dyed and starched at one operation as the heavy weighting materials would be apt to settle out.

Pocketings intended for blacks or slates require scouring thoroughly not only that they may dye evenly, but also that they may wet out more evenly in the dye or finishing liquor. Goods for light, delicate shades must of course be bleached.

Possibly the best method of scouring to use for these goods is to steep the goods in a diastafor solution over night, then sour in hydrochloric acid at about 2 degrees Twaddle, wash well and dry up.

Venezuela as an Export Market.

BY ERNEST L. LITTLE.

Venezuela, the northernmost republic of South America, offers an unusual market for the products of American manufacturers of textiles. Consisting of twenty states, two territories and one federal district, with an area of 393,976 square miles and a population of about 2,850,000, Venezuela imported over $4,000,000 worth of textiles annually during pre-war years. Of this amount, the United Kingdom furnished about two-thirds, while the proportion from the United States was less than one-tenth of the total.

The war, however, created an economic advantage for American exporters and while the total imports decreased, the per cent of merchandise from the United States materially increased.

The population is composed of Spanish, Negro and Indian elements, and out of the total population, the Indians number about 320,000, the remainder being mostly of mixed blood. The number of pure whites and negroes is very small. The large market for textiles is therefore to be found in meeting the demands of the Spanish and the small foreign or white element.

An analysis of the import statistics indicates that prints are in greatest demand, of which Great Britain supplied the largest portion during pre-war years. The quality that is generally imported is of the lowest grade with considerable starching. Owing to the impossibility of securing prints and other cotton goods from the European countries during the war, the Venezuelan importers turned to the American exporters not only for print goods, but for all other classes that were formerly purchased from European countries. It remains to be seen, however, whether the American exporter will continue to retain this trade when Great Britain and Germany are in a position to reenter the Venezuelan market. In order to meet this competition, every effort should be made not only to merchandise the class of goods that meets the requirements of the foreign buyer, but also to follow the marketing methods that are necessary to successfully introduce foreign textiles.

The opportunity presented by the Venezuelan market to the American manufacturer of textiles depends to a very great extent upon his ability to secure satisfactory and permanent connections with a Venezuelan house. Such connections constitute, in fact, the important factor in the success or failure of any manufacturer who is endeavoring to enter the market.

The exporter desiring to place his line with an agent in Venezuela must be certain that the house to which he intrusts his business is well represented in each of the commercial districts of the country. To secure adequate representation it is necessary to grant the agency to a company that has commercial travelers or sub-agents who cover the entire Republic. The chief port and trade center is La Guayra which has excellent transportation connections with the United States. From this city, Caracas, which is the capital, can easily be reached, the distance being about twenty-five miles inland. Many large distributing houses are located in this city which cover the entire country with their commercial travelers and sub-agents.

Frequently it has been found advisable to establish agencies in the other commercial districts such as Cumana in the state of Bermudas, Ciudad Bolivar, the capital of the state of Bolivar, and also Maracaibo, a center of considerable commercial importance in the state of Zulia. Maracaibo is also the only western port of Venezuela and a large amount of merchandise for Colombia passes through this port.

In the selection of an agent, great care should be taken to avoid granting a contract to a house representing competitive lines. The majority of importers of textiles have in the past, been either German or English houses who are perfectly willing to represent American houses. Upon securing the exclusive contract from the American manufacturer, no attempt is made to merchandise his products, the American exporter in the meanwhile wondering why there is not a market for his cotton goods in this country.

The question of credit in Venezuela is a difficult one and great care should be exercised to secure complete credit information regarding the financial standing and responsibility of the prospective purchaser. Owing to the fact that "to order" shipments are prohibited and that it is possible to clear merchandise through the custom house without the usual protection to the shipper, a careful study of the credit risk is necessary. If the results of the credit investigation are such that it is not desirable to extend credit, there are two methods that can be followed to overcome the possibility of loss, the first being to consign the merchandise to a reputable custom broker or commission house in Venezuela with instructions to deliver the goods to the buyer only upon payment, and the second to request the foreign purchaser to open confirmed credit in the United States. By the second method, the American exporter is able to receive payment for the merchandise before it is shipped, upon presentation of documents. If, however, the credit investigation reveals that the prospective customer is entitled to an extension of credit, the documents can be mailed direct to the consignee and the draft forwarded through a local bank to its correspondent in Venezuela for payment or acceptance.

When preparing the documents covering a shipment to Venezuela, every effort should be made to follow the custom requirements of the country. Violation of these requirements is punished by fines of considerable amount.

It is necessary to remit to the Venezuelan Consul an invoice made out in triplicate written in Spanish and on which the shipper states on oath:

1. The names of the exporter and of the person to whom the goods are being sent.
2. The port from which the goods will be shipped and the port for which they are destined.
3. The class, nationality and name of vessel.
4. The mark, number and nature of each package, whether case, bale, crate, etc.
5. The contents of each package.
6. Its gross weight in kilograms, in letters and in figures.
7. Its value in gold at port of embarkation and in the currency of the country.
8. Date of shipment.
9. The signature of shipper.

The number of packages and their weights and values should be added at the bottom of the respective columns, expressing the totals in figures and underlining them twice.

According to the custom house regulations, when several classes of goods paying different tariffs of duty, are packed together, the highest rate will be charged for the entire package.

Improving on Nature.

The new nation-wide use that water has been enjoying since July 1 recently prompted a "bard of chemistry" connected with a famous Pittsburgh scientific institute, to divulge why water is "soft."

"While water is abundantly distributed," he said, "it never occurs pure in nature. Its nearest approach to the pure state in nature is found in fresh rain water. In natural waters, in lakes, rivers, wells and springs, there are always in solution in greater or lesser quantities various substances whose presence influences the properties of water. The most common of these substances are carbon dioxide (a gas absorbed from the air); various salts of sodium, such as sodium chloride, or common salt; calcium salts such as chalks and limestones, and compounds of iron, aluminum and magnesium. The quantity of these is what determines the 'hardness' of water."

The fewer there are of these, the softer the water. Since rain water is almost chemically pure, it is soft. Commercially the greatest quantities of soft water are used in the modern laundries. Practically every one of these has a soft water plant, by which the impurities are artifically removed from ordinary water. But as the advantages to be derived from using water of zero hardness are becoming better understood, many textile plants are installing this special equipment.

Uniformly soft water not only produces a saving in the amount of soap used but assists in the securing of more even shades in the dyehouse. It was also brought out in the discussion at the recent meeting of the Southern Textile Association that investigations are now being made to determine the advantages of soft water in the slasher room.

"Why Read?"

BY W. H. STEVENS.*

I made a conscientious, nay an almost heroic attempt recently, to read that autobiographical work so highly commended by the critics "The Education of Henry Adams," —the hero a member of one of the most useful families America has produced. After reading many chapters with growing rage, because his almost invariable comment on what seemed to me a succession of the richest opportunities ever placed before a youngster was, "All this contributed nothing to the education of Henry Adams," I finally reached his discussion of the relative values of the Virgin Mary and the dynamo. Then a genuine brainstorm intervened. I hurled the book into the arms of the unsuspecting friend who loaned it to me with the injunction that he should never affront my eyes with a sight of it again. In calmer moments I recall, now and then, an item from the book which suggests that my judgment and my temper might have been a bit hasty.

Among other wise things, he said that education is for the purpose of enabling one to *judge his fellowmen*. Many of us might dispute that dictum but that's neither here nor there. Some friends conferred with define education in terms to indicate that Mr. Adams was headed in the right direction, but his track was too short and too narrow. Their argument (if you will permit me to seem to be philosophical though I only know philosophy by hearsay), runs as follows:

Herbert Spencer describes life as *harmony with one's environment*, death is just *dis*harmony with one's environment. I take that to mean in your language and mine, that we live only while we get along rather well with what is around us and when we get "on the outs" with what is around us we die, or at any rate, we would better. Now our surroundings consist of folks, things and events. If, therefore, Spencer knew what he was talking about, and he certainly was an exceptionally wise old man, we will live best and longest if we harmonize with all three elements of our environment—that is, for example, with folks by doing what folks generally approve, with things by climbing the pasture fence when the bull, which will answer for a thing, hints that we would better, and with events when we step out from under a falling safe.

That argument should make the reason why education is desirable, very plain. If it's the right sort of education, we learn all we can about our environment, what it wants, what it will do to us or how it reacts when we do or omit certain things. If we try to learn only by experience, we will lead a painful and rather short and useless life. If we get an education before deciding important things for ourselves, we are just learning from others how to *harmonize with our environment* and so we begin *early* to live efficiently and comfortably. Of course the more varied one's environment, the more sorts of education he needs. The oyster, not being very active—or pugnacious—or noisy, has to know very few things to harmonize. The hen has to know quite a lot more than an oyster because she has more environments. (Have you noticed how she has improved her education about autos in the last few years?) The Indian needed a more extended but nevertheless a very simple education. Civilized man certainly has his work along this line cut out for him. New laws, new prohibitions, new rights, new tasks, new customs, new dangers, new germs, new diseases, imprison him in an environment where opportunities for disharmony are as thick as cooties in a doughboy's blanket.

But you have had set up before you again and again how much and why you need to do the work of the curriculum that is offered you here, how it will serve you in new and unexpected satisfactions, how it will increase your commercial efficiency and rewards, how it will elevate and dignify every department of your service, and how it will even lend a new interest to your daily tasks and give you enthusiasm in toil that would be, without this laporiously acquired knowledge, as flat, as tasteless, as insipid as—as—well let us say as many of you have already found it. I both hope and fear it has been a waste of precious time to repeat all this to you. Your presence here would seem to indicate that you all are convinced, have girded your loins for the fray, and are willing to make the needed sacrifices of leisure, to gain a certain goal. Some of you will lose touch, of course, but many of you will "carry on" and "see it through," though you find that of "writing many books there is no end and in much study there is weariness to the flesh."

You are to be congratulated that this great school of technical scholarship has been inaugurated and that it has such untiring and competent leaders. It makes the hope for the eventual elevation of our business an enduring one and our successors, when we now on the floor shall have melted into the infinite azure of the past, will quite misread history if they do not date the upward turn of our business towards higher grades to these very years.

The future of our business lies with you and you *can* make it so different from the past that your wonder will then be not that your forbears came through so well, but that they came through at all. We have been and I fear still are so crude, unstable, "hit and miss," like "ignorant armies clashing by night." Our saving remnant of wise ones, who add science to their wisdom is so small that though we cannot be the greediest of the greedy, we certainly are numbered today by the public and their officials, among the suspected classes. Let me protest with vehemence that not all our sins are the result of evil intent.

No one would think of saying today, "Go to, now, I am a plumber" (though some alleged plumbers seem, to have so happened) and immediately begin to wipe joints and lay out sanitary equipments for 1,000-room hotels. Such things aren't done that way. So, too, it isn't done that way if we want to be oculists, or aviators or preachers. You young men evidently see the trend. You are trimming your sails to this new breeze, and I congratulate you. Your resolve means everlasting plugging at courses that are quite uninteresting at times, seemingly remote from the demands of daily life, complex, mystifying, foggy and—and every other gloomy adjective you can think of. It means drawing on all your reserves of endurance to carry you across morasses of fatigue, boredom and tempting distractions. But some

*Extracts from an address by Mr. Stevens, who is President of the Agricultural Insurance Company.

of you have already found that the more swamps of this sort you wade through the easier the swamp is to wade. The struggle grows less with each victory.

We are all familiar with the statistics that show how college-bred men predominate in the lists of the world's celebrities. Those lists are rather depressing to men who have missed the opportunity of a University training. To learn that only one man in one hundred is a college graduate, but that 1 per cent furnishes 73 per cent of those mentioned in "Who's Who," 75 per cent of our Presidents, 70 per cent of our Supreme Court Justices, etc., does hint that it is a bitter handicap to have been compelled to leave school in the lower grades. But it is a mistake, an almost inexcusable blunder, to surrender in the race because your competitor has had a better coach than you. The first prize oftenest goes to the horse that has the pole but not always. Even the worst placed, if he belongs in the class at all, if he's "all horse" as the jockeys say, need not remain among the ruck of the "also rans." But how narrow a view I am taking, as though beating the other fellow was the leading motive. God forbid! I do regret that *any* young man or woman misses the experience of at least the four years customary in college curricula but I really *pity* very few of them. Many of them have had the chance and tossed it over their shoulders. Others have taken the chance and murdered it in cold blood through four wasted years of idleness and attendant vices. Others learn and learn and learn but *think* never. Oh, collegians are a miscellaneous crew. You need not surrender to them at sight. You can train, too. You have your school of Experience which turns out some clever graduates. You have your school of Necessity, which puts you, if you are wise, to very pretty paces, and you have your school of Sacrifice, which, if you absorb its spirit, confers high Degrees and rewards of unanticipated richness.

The President of one of our great colleges has just told his students that social conditions of the present have demonstrated anew two things often demonstrated before, that men cannot be free unless they are *intelligent*, that democracy without schools is a self contradiction but that education without *intelligent unselfishness* will never save the world. He says that two-thirds of what is being taught in the schools, however necessary it may be, has little effect in making people *better citizens*. As an old preacher friend of mine used to say "Universal suffrage may do *for* the millennium but it will never hasten it!" So I would qualify my predictions of what these technical curricula will accomplish by the caution that Science, even with a big S, will not save the world. That is not the whole of the truth that shall make you free. This at last brings me to my thesis. That you should supplement this severe course of technical work by devoting some of the little leisure it leaves you to the cultivation of a taste for good reading, if you haven't one now. Of course no two scholars would select the same five-foot shelf. Most of the classics are "pretty hard bullets to chew" until our powers of intensive reading and reflection have been developed by practice. Then, I have a bit of sympathy for *living* authors. Finally one prefers to give advice that stands a fair chance of being followed and I doubt if the modern American youth will ever obey injunctions to spend his evenings with extreme sober Christian, Meditative Marcus, Piscatorial Isaac or the Omar of the Jug who takes out all his fun in just singing about it. I have not, myself, at three score, yet graduated from the magazine stage of literature but I have arrived where all magazines do not look alike.

Of books, oh, where shall one begin or end? Bearing in mind that we have education in view and that the purpose of education is to enable one to harmonize with his environment and that to so harmonize one must know how to judge men and things and events, we may escape the impossible task of building up an all-inclusive list and stop with suggesting a few principles of selection that may make the path of ambitious experience fairly enjoyable.

First, as we are seeking how to be both comfortable and efficient, and we are in touch from birth to death with *things*, we ought to read a little natural science, enough of chemistry, for instance, to know the atomic and molecular theories of matter and why sweetening your coffee is a different process of change from uniting a purple, strangling gas with a brown metal that burns when you wet it and making thereby common table salt. A little physics, teaching us how such universal energies as gravity, light, heat and electricity behave under varying conditions. Even if we already know enough about electricity to harmonize with it by keeping away from live wires, or about gravity not to jump off a church spire or to let a man step in our eye, we will find the study of the more complicated behavior of these powers intensely entertaining.

But the most interesting study for mankind is—folks. Some people hold that we have too many of them in our environment and most of us would admit that that is true *of some sorts*. But that only emphasizes our need to know. Aside from our daily intercourse, we learn about people through such books as novels, the drama, poetry and histories including biographies. You will naturally grow wiser and better for the right reading of the right books, and you will have a very handy resource for pleasure that at times reaches the degree of delight.

A nicely lithographed calendar, in three colors, is being distributed by the General Electric Company, Schenectady, N. Y. This calendar is of suitable size to be used as a wall calendar and contains twelve sheets, on each of which is the calendar for each month, together with the preceding and succeeding months. There are also illustrations of installations and of uses of this company's products on each sheet.

A great deal of interest is being manifested in England in the development of research work in the textile industry, as well as of the courses of instruction in this and allied subjects. The Belgrave Mills, Oldham, is prepared to give the sum of £100 so that scholarships may be formed. to be tenable for three years, for the furtherance of industrial knowledge. It is also stated that other textile mills will give similar sums for this work.

It is estimated that 1,200,000,000 tons of goods are hauled yearly by motor trucks. Every truck displaces five horses. The cost of maintaining and operating a wagon and team of horses is 33 cents per ton mile. The cost per motor truck ton is 15 cents. There are 800,000 motor trucks in the United States today and according to statistics compiled by the "Motorize the Farm" bureau of the Goodyear Tire & Rubber Co., Akron, Ohio, there will be 1,000,000 on January 1st, 1920, although there are less than 100,000 trucks in use on the 6,000,000 farms in the country.

Industrial Relations at the Ballard Mills

BY GUSTAVE A. BREAUX.

In approaching my subject, "The Industrial Relations at Ballard Mills," I do so from the several angles that constitute what we have done and hope to do in the evolution of things at our mills. To help you to a better understanding, let me summarize that Ballard Mills have been doing business in Louisville for the past forty years; we have grown from 36,000 barrels of wheat flour, as the first annual output, to 800,000 barrels; we now operate a corn mill of 7,500 bushels daily capacity, and are fast developing a cereal specialty business. Our organization is at present composed of 50 men and women in the Louisville office, 80 in branch offices in the principal southern cities, and 260 workers in the wheat, corn and cereal plants. Total 390 men and women. While statistics, compiled by the U. S. Bureau of Labor, show that the cost of living on the basis of a family budget has increased from 73 per cent to 79 per cent during the past five years, we have increased our wages 100 per cent. Bearing in mind these fundamental things in the industrial life at Ballard Mills, I invite your consideration, first to the subject of profit-sharing.

Profit-sharing must not be confounded with stock subscription plans and bonus systems. The bonus to employees is simply an additional wage; the stock subscription plan is simply giving the employee a chance to invest; profit-sharing contemplates primarily the earnings of the concern, fluctuating year by year in proportion to the results achieved. The essence of true profit-sharing is based upon the premise that a fair share of the profits belongs to the worker—that is, a fair share of the profit inherently belongs to the worker or employee irrespective of any profit-sharing plan—and that under the profit-sharing plan the worker will produce enough money additional to pay his profit-sharing dividend.

If I have made myself plain, it follows that no company or concern can establish a sound profit-sharing plan for its employees on the mere desire to make money for itself. It then becomes a scheme to camouflage the worker, to bait the employee with potential profits on the one hand and keep down wages on the other, and as such is unfair and will in time act as a boomerang upon the employer.

Our history in profit-sharing dates back to 1886 when we began the experiment of sharing ten per cent of our profits with our employees, part to the office force and part to the men in the mill. This ten per cent was gradually increased until before the war (April, 1917) it amounted to about one-third of the profits before any dividend was paid to the stockholders. Up to this time our milling business, while incorporated, was in effect a private firm owned by Chas. T. and Thurston Ballard. One-third of the profits went to each of these two partners as stockholders and the other third we divided among the office force and the workers in the mill in proportion to salaries and wages paid. The criterion of each man's worth to the concern was based upon the salary paid, so the greater the salary, the greater his proportion of profits. The amount of money given to each laborer in the mill totaled from three to five weeks' wages. Of course, some years we made a great deal of money; other years, very little. *My conviction is that our profit-sharing plan is a potent thing for building up loyalty and efficiency among the salaried men, such as heads of departments, salesmen, bookkeepers and clerks, but that is not potent among the laboring men and women in the mill.* (Italics are ours.—Ed.) Profit-sharing will not of itself hold the wage earner if he can get higher wages elsewhere, or if he becomes suddenly disgruntled. Why? Because the wage earner lives from week to week, based upon his pay at the end of each week, and he is not sufficiently influenced by a five-weeks' check at the end of the year. Twelve months is too long to wait for a check representing a division of a certain quota of the concern's profits, but when the check per se is not big enough to count either in meeting an emergency or in accumulating a competency.

I am firm in my opinion, however, that our profit-sharing plan, as it has evolved since 1886, has a great sentimental value among the people of our institution, so while frankness compels me to say that it has not been a success in dollars and cents among our wage earners, the scheme plays its part in building up the morale of all employees and in creating a happy Ballard family. No, I should not vote, as a director of our concern, for abolishing our profit-sharing plan, imperfect though it may be.

To my mind, the ideal division of profits is based upon arriving at the end of the fiscal year at the net profits of the twelve months' business; and then dividing these net profits into three equal parts—one part to surplus to strengthen the business against possible adversity, one part to the stockholders as a return on capital invested, and one part to the employees, or workers, prorated according to the individual earning capacity, as their rightful share of the annual profits accruing from their own labor, efficiency and loyalty.

Our first crude effort at welfare work dates back to 1900. We established in the mill proper wash rooms, with free soap and towels; later we added shower baths and lockers for the men; finally, several years ago, a rest and reading room with tables, pianola and billiard table. Today we have three club rooms for the men and women—one being exclusively for the colored men with its shower baths, pool table, etc. Within the past year we have reconstructed a building at a cost of $15,000 immediately back of our main office building, where we have featured two important factors in the evolution of our welfare work. One feature is an up-to-date cafeteria where the entire Ballard family, from the president down to the stable boss, can get an excellent meal at the actual cost of the food, this cafeteria being open day and night; the other feature is the assembly hall where we hold public meetings and where the women's clubs hold dances for the employees and their friends twice a month. It is also here that the women hold their bi-weekly classes in calisthenics under an instructor. It is here we have the nucleus of a library. It is here we have our community singing. This building also includes a rest-room for the women, shower baths, lockers, etc. This assembly hall is the best medium we have for

Being extracts from an address by the Vice-President of the Ballard & Ballard Co. before the Kentucky Conference of Social Workers. This abstract of the methods used by these well known flour manufacturers is of interest in connection with the discussion on employee representation.

the mental, physical and social development of the men and women of the office and both mills.

As for the cafeteria, it is the last advanced step we have taken in the effort to democratize the men and women of our entire plant, for to break bread over a table is the one practical way of securing the personal touch between employer and employee, as well as between employee and employee. For years we served a free meal each noon hour for all of the clerical force, including the head miller and superintendent, and this free meal with hot soup and coffee for the day and night workers, cost the company $7.500 per annum; but today the free meal of many years' standing has been done away with and all eat in the cafeteria and pay cost prices for food, except that coffee, soup and bread, in accordance with the old custom, are still served free. The estimated cost of operating our cafeteria, which we formally opened to our employees on November 1, 1919, will approximate $13,000 per annum. The offset to this charge will be what we get back in cash from the employees each day in payment for the actual cost of food each individual consumes.

On March 1, 1908, a Ballard Aid Society was organized by the employees. This organization has been a success from its inception. Membership is not compulsory. About 60 per cent of the employees belong to the society. The first year of an employee's connection with the company it costs him 40 cents per month; thereafter only 20 cents per month. The company pays into the treasury of the aid society, 10 cents per month for each member. The aid society pays its members $6.00 per week sick benefit and $50.00 death benefit. We are now engaged in working out a plan for the aid society, with the cooperation of the company, to insure its members for $500 death, 65 per cent of their weekly wages in sickness, and pension after reaching a certain age, and insurance against unemployment. By unemployment I mean the loss of wages during periods when the mill cannot be operated. It will probably be several months before we have completed the details of handling these various forms of insurance, but it is only a question of time until the plan is put into effect.

The most progressive step ever taken in the industrial life of our company was on July 1, 1919, when the sole owner of the business, S. Thurston Ballard, opened the door wide to employees for purchasing stock and becoming bona fide partners in the business. Mr. Ballard sold stock to 38 employees at the identical price he had paid his deceased brother's estate for its 50 per cent holdings. He promises to sell further stock as the employees are able to absorb further stock. No outsider need apply. Each stockholder pledges himself or herself, to sell his holdings back to the company at cost value in case of death, resignation, or dismissal for any cause. It is to be a Ballard family in fact as well as in name. Thus has been forged another link in the chain designed, so far as our individual business and the force of example is concerned, to tie together the three competing groups, capital, labor and the public.

Back in 1902 when the coal strike was on, Roosevelt said there were three parties in the industrial problem, labor, capital and the public. If business management had always been honest with itself, as well as with others, if it had builded on other than ignorance and selfishness, we should not have clung so tenaciously in recent years to these three artificial distinctions. It is no use setting up the group idea, labor, capital and the public, as if each were in contrast and competition with the other. The truth is that each is dependent upon the other, just as it is equally true that all must obey and uphold, indeed fight for if need be, the Constitution of the United States if our beloved country is to endure. Now, the point I am trying to drive home is that unintelligent business management is largely responsible for these artificial distinctions, whether we find it in individual business or in collective enterprise. Today the big idea in general life is that of one cooperative group, pledged to the service of the public.

So the management of our business has come gradually to accept this cooperative idea. As an example of the very last word in cooperation, we now state in our newspaper advertisements: "This advertisement has been read and approved by the employees of the Ballard & Ballard Co." We have this year developed the actual management of our present expanding business through two mediums—a board of directors of seven members, and a committee of 22. The directors meet once a month; the committee once a week. One of the directors is our head miller; a practical man who has been identified with the labor of our mill for the past 40 years as he started in the service a mere boy in 1880 and has never worked anywhere else. The committee includes the officers of the company, the heads of the departments, the head miller, the superintendent, the engineer, all the foremen and the directress of our welfare work, who employs and has charge of all the women in both plants. The function of this committee is to offer suggestions for the betterment of the business with due consideration for the clerk in the office, the laborer in the mill, and the stockholder, whether present in person or otherwise. This committee stands theoretically as well as actually for the principle of collective bargaining, i. e., the right of labor in the plant to representation. In this committee the rights and privileges of each and all inhere, and on request of any man or woman in the mills, his or her rights and privileges are analyzed and defined. We call this "industrial democracy".

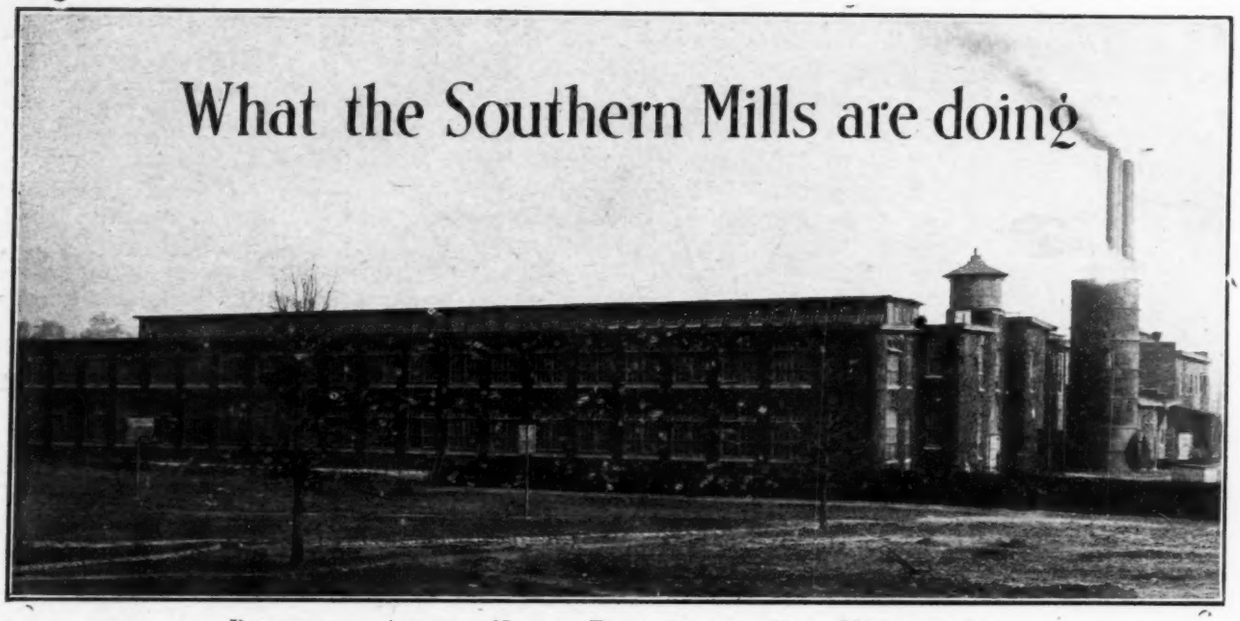
On December 11 a fire occurred at 4 p. m. in the dye raw stock department of the main building of a southern mill. It originated in one of the dryers due to a hot bearing. The damage resulting was confined to belting and stock. Loss, $168.16.

On December 18 a fire occurred at 10 a. m. in the picker room of another southern mill, due to a hot bearing on the breaker machine. From here it spread to the No. 3 breaker lapper. The damage resulting was confined to machinery and stock. Loss, estimated, $250.

An application of ball or roller bearings on cotton mill machinery will prevent fires resulting from hot bearings. In addition there is a large saving of oil for lubrication.

The Belmont Iron Works, 22nd St. & Washington Ave., Philadelphia, is sending out a calendar for 1920 which, in addition to showing the current month with the month before and the month after, in line for ready reference in estimating shipments, etc., also shows half-tone photographs of the Belmont works as well as of representative structures which they have designed and erected.

What the Southern Mills are doing



PLANT OF THE AMERICAN NET AND TWINE COMPANY, BLUE MOUNTAIN, ALA.

Announcement has been made of the purchase of the Necronsett Mills, Cumberland, N. C., by Clifton Corley, president of the recently organized Vardry Mills, at Greenville, S. C., and several capitalists from Fayetteville, N. C., from the estate of Frederick Houston, of Philadelphia, Pa. Among the Fayetteville men interested in the purchase are J. V. McGougan and John R. Tolar, Jr. Mr. Corley was merly the general manager of the Necronsett Mills. He has been elected president of the new company, which will be organized with a capital stock of $500,000, of which $250,000 will be common and $250,000 preferred stock. The other officers will be elected some time in February.

A syndicate headed by Milton F. Goodman, president of the Reliance Manufacturing Company, of Chicago, Ill., and including several prominent Chicago business men, has purchased several Mississippi cotton mill properties, the amount involved in the deal aggregating $1 000,000. The Winona Cotton Mills, Winona, Miss.; the Yazoo Cotton Mills, Yazoo City; and two large mills at Natchez are included in the purchase. The mills purchased total about 50,000 spindles and manufacture drills and chambrays. It is understood that the Reliance Manufacturing Company, which is said to be one of the larger work-shirt manufacturers in the country, will take over the entire output of these mills for its own consumption in the manufacture of these shirts.

C. B. Armstrong, head of the Armstrong chain of mills, has announced the organization of the Mildred Cotton Mills Co., at Gastonia, N. C., for the spinning of fine cotton yarn. The authorized capital stock of the new organization is $400,000. All of this has been subscribed with the exception of $150,000 which has been reserved for the operatives of the mill and the operatives of any of the Armstrong chain which, with the addition of this new one, includes 12 mills. A site consisting of 30 acres has been purchased on which this new plant will be erected.

The property on which the plant of the Syleecau Manufacturing Company, Rock Hill, S. C., is located has been purchased by W. R. Armstrong. The new owner announces that it is his intention to erect thereon a yarn mill containing at least 3,000 spindles. The machinery for the new structure has already been ordered. About 15 new houses will be built to accommodate the increased number of operatives. The deal and the contemplated buildings will entail an expenditure of about $150,000. It is also announced that the new owner plans to add to the present building.

The capacity of the Henrietta Mills No. 2, Caroleen, N. C., is to be doubled in the near future, according to an announcement given out by the president, S. B. Tanner. Approximately 13,000 looms and 50,000 spindles are to be added to the present equipment. About 1,000 additional operatives will be required, which will necessitate the building of practically a new town at Caroleen. The estimated cost for the new installations is $65 per spindle.

The Selma (N. C.) Cotton Mills have been sold to the Standard Textile Products Company, which, with headquarters in New York, has mills in four southern states. The price paid is said to have been around $500,000. The new owners plan to spend about a half million dollars at once in enlarging the mill and adding new weaving machinery. Improvements are also planned for the mill village.

The Banna Mills, Columbia, S. C., have been commissioned with a proposed capital stock of $500,000. The business contemplated is the manufacture of cotton yarns into cloth, the buying and selling of cotton and the owning and operating of warehouses. The petitioners for the charter were J. P. Matthews, E. Shand and J. M. Mauldin.

A recent amendment to the charter of the Iola Manufacturing Company, Stanley, N. C., increases the capital stock of this organization from $200,000 to $500,000 and provides for the erection of another factory.

The Capelsie Cotton Mills, Troy, N. C., have been purchased by D. E. Rhyne of Lincolnton, N. C., and associates and will be taken over by a new corporation to be known as the Rhyne-Anderson Mills Company and which will have a capital stock of $200,000. E. O. Anderson, president of Anderson Mills, Inc., Lincolnton, N. C., will be president and Mr. Rhyne will be vice-president and advisory manager.

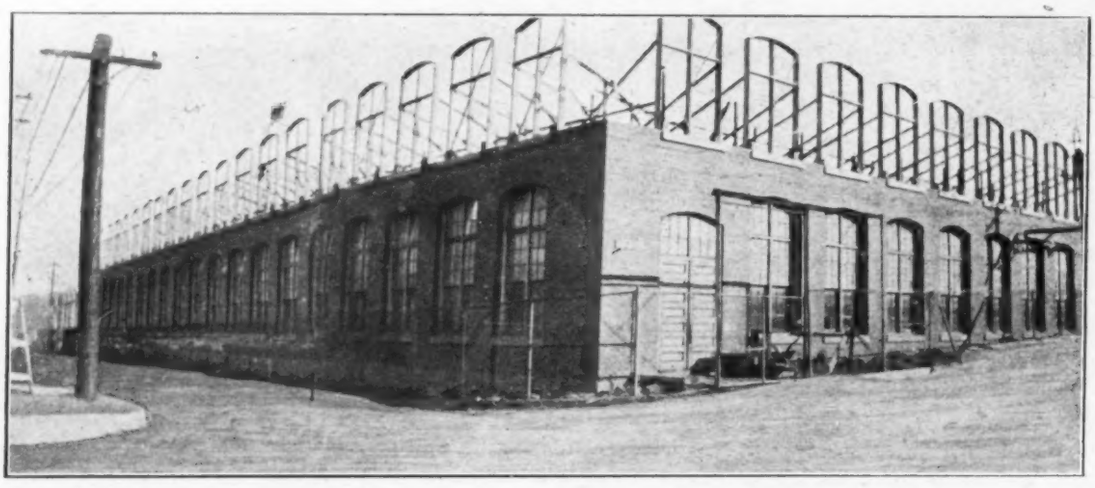
Controlling interest in the Mountain View Manufact-

uring Co., Gastonia, N. C., has been acquired by W. T. Rankin. This is one of the Armstrong group of mills and C. B. Armstrong still retains holdings in the stock but gives up control. The mill has 5,000 spindles working on coarse yarns. The capacity of the mill will be doubled by a new addition, nearly completed, which will hold 5,000 additional spindles. When work on this addition is finished, the entire mill will work on combed yarns, spindles having been purchased for this purpose.

Thirty-five acres of land have been acquired by the Chadwick-Hoskins Company at Pineville, N. C., upon which

The Highland City and Chinnabee Cotton Mills, at Talladega, Ala., are to be merged into a new corporation to be known as the Samoset Mills of New Bedford, Mass. In the near future, $1,000,000 will be expended in improvements and for additional equipment at the mills, as noted. Under the new arrangement, the mills will manufacture denims.

Interests of which Jacob Phinizy is the head have purchased a controlling interest in the Sibley Manufacturing Company, at Augusta, Ga., which was recently sold to Barrett & Company. This company is capitalized at $900,-



ADDING ANOTHER STORY TO THE WASTE MILL, ANCHOR DUCK MILLS, ROME, GA.

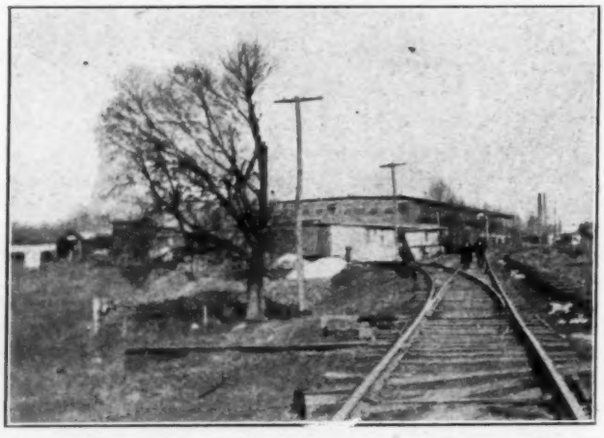
enlargements will be made to the company's plant there. It is stated that several community features will be included in the new buildings. Among these will be a club-house, recreational grounds and other facilities for the betterment of the physical and social surroundings of those associated with the mill.

The Mississippi Cotton Mills, Wesson, Miss., have been sold by the present owners to a group of Copiah County (Miss.) business men. These mills were dismantled several years ago and all the machinery and equipment sold. The buildings will be demolished and the brick, lumber and other materials will be sold. It is said that after the buildings have been razed residences will probably be built on the property.

ANCHOR DUCK MILLS, ROME, GA., FROM THE RAILROAD TRACK. WASTE MILL CONSTRUCTION IN THE DISTANCE.

000 but the purchase price was not given out. It is rumored that Mr. Phinizy will be elected president and S. A. Fortson, vice-president at the annual meeting of the stockholders in the latter part of February.

The Howell Manufacturing Company, Cherryville, N. C., of which D. E. Rhyne is president, is to construct a



ANOTHER VIEW OF THE ANCHOR DUCK MILLS. GRADING AT THE LEFT OF THE RAILROAD IS FOR ANOTHER NEW ADDITION.

brick addition, 400 x 70 feet, at an approximate cost of $75,000.

The Holt Granite Mills, Haw River, N. C., have appropriated $10,000 toward the new school building which is to be built there during the coming summer.

The capital stock of the Okeh Manufacturing Company, at Greenville, S. C., has been increased from $75,000 to

$200,000 by a recent amendment to its charter.

The Tipton Cotton Mills, Covington, Tenn., have been sold to the L. B. Channel Chemical Company, of Chicago, for a consideration of approximately $250,000. The plant will continue to manufacture yarns under the new ownership.

It is reported that the Ruby Mills, Gastonia, N. C., will erect another mill, capitalized at $300,000. The proposed structure will have 6,000 spindles and fine yarns will be manufactured.

The North State Cotton Mills, Taylorsville, N. C., have been incorporated with a capital stock of $500,000 by James, A. E. and A. W. Watts.

It is reported that the Edna Mills, at Reidsville, N. C., contemplate the erection of an additional plant to be equipped with 30,000 spindles.

The plant of the Washington Mills, Fries, Va., is being enlarged with the addition of a new weave shed.

It is announced that the J. B. Duke interests of Charlotte, N. C., have acquired the Rhodhiss Manufacturing Company and the A. E. Smith Manufacturing Company, at Rhodhiss, N. C. The purchase price was not given out.

The Montgomery (Ala.) Cotton Manufacturing Company has been organized with a capital stock of $200,000 by Frank Elmore, Jr.

The Cotton Belt Manufacturing Company, Rocky Mount, N. C., has increased its capital stock from $10,000 to $50,000.

A dye house is being built at Hamilton Carhartt Mills No. 4, Mobile, Ala.

An extension is to be built to the picker room of Mill No. 1 of the Pomona Mills, Greensboro, N. C.

The West Point (Ga.) Manufacturing Company will build an extension 100 x 350 feet and three stories high to the Langdale plant of the company; 5,000 additional spindles and preparatory machinery will be installed. Additional warehouses will also be built, the entire construction entailing an expense of approximately $3,000,000.

The sum of $125,000 has been appropriated by the Steele Cotton Mills, Rockingham, N. C., to be used in providing a new school and recreational building.

The Piedmont (S. C.) Manufacturing Company is remodeling and extending the power plant of its No. 3 mill, putting in additional water wheels and generators. A community laundry to handle work for 500 families will also be installed, as well as an ice plant.

The Pacific Mills Company, Columbia, S. C., has increased its capital stock from $15,000,000 to $20,000,000. Lockwood, Greene & Co., Boston and Atlanta, are the managers of this company.

The Baldwin Cotton Mills, Chester, S. C., will install a complete sewer system for their mill and houses. J. E. Sirrine, Greenville, S. C., is in charge of the engineering work.

A $16,000 laundry will be installed at the Glenn-Lowry Manufacturing Company, Whitmire, S. C., and plans are being prepared for a complete sewerage system for the mill village.

It makes no difference how much a man thinks, unless he imparts his thoughts to someone, or puts them into action himself, he might as well have not thought.

The New England Mill Situation.

The rapidly rising prices of mill stocks and the purchasing of mills in this section show how vast has been the change brought on by war. Negotiations are under way looking toward the purchase of three or four mills by Japanese interests, the purpose being to disband the organization and take the machinery to Japan. Thus far it is stated that no transaction has been actually closed although preliminary examinations of properties have been completed and contracts to buy have been made.

Three small mills of B. B. & R. Knight, Inc., located north of Providence are reported to have been sold out but final confirmation is lacking, and at least two mills in Connecticut are reported as under contract to be sold within a short time. The efforts of tire manufacturers to buy properties in New England to be used for yarn production are still continuing and fully 500,000 spindles are in the course of construction to be installed in various places for these factors. Of the 1,000,000 spindles to be added in New England in the next two years in accordance with plans made, less than half will be devoted to the production of cloth for dress wear.

Much of the activity in mill stocks has been in the older corporations having offices in Boston, or in the fine goods mills. Considerable buying is reported in Fall River mill stocks but offerings are very limited and the bidding has lacked the speculative features reported from England or the South. No stocks are now reported below par and many have doubled. Some are three and four times par. It does not seem thus far as if any broad movement is afoot to purchase the control of mills but in some quarters it is stated that brokers are at work trying to secure options on certain properties which will be offered to prospective customers later on.

Many holders of New England mill stocks would be glad to sell at the prices now quoted if they could see any way to avoid paying a large part of the accrued profits over to the government for taxes. The great bulk of mill investors of long experience do not trust the holding power of present values nor do they think that cotton mill investments based on such values can pay in the long run of the years. Capitalized at $10 a spindle or less, before the war mills were rarely anything better than a 6 per cent investment over a period of a quarter of a century and it is hard to convince old holders that a capitalization of $30 a spindle is sound. Nevertheless, buyers are to be found who will pay that price and higher, especially if a controlling interest is offered.

The purchasing of old mills by Japanese interests in order to secure machinery at once is a most interesting development to mill men. Their eagerness to sell is perhaps the best barometer of how they feel concerning future competition. For months past Japanese interests have been trying to buy machinery here for delivery over a two or three year period and some orders have been accepted. But as a rule the machinery men have been so well engaged that they could not take on any additional business. Owing to the low cost of labor in Japan it is thought possible that mills equipped with machinery 20 years old or more can be made to pay, but the astute New England manufacturer much prefers the chance that prices may be lower before competition from such a source develops and he will be quite willing to risk an opportunity to invest in new and up-to-date machinery.

It is thought very probable that Japanese investment in textile machinery will be made the basis of a great deal of political talk, especially if a tariff bill is introduced into Congress in the next two years. But it was shown in Lancashire many times that cheap labor is not a safe basis on which to rely for successful competition, whether that labor is found in Japan or India, where cotton mill investment has been increasing.

The markets for goods have been very firm and buying has been active. Many prices are now at such high levels that manufacturers wonder whether consumers will be able to pay well enough to keep all the mills busy. Staple ginghams have reached a level of 27½ cents a yard, staple tickings 55 cents for 8 ounce goods, denims, 47 cents for 2.20s, flannelettes, 35 cents for goods of the 1921 type, bleached cottons, 34 cents for Lonsdales, and print cloths have sold as high as 24 cents for spots at Fall River. The mills are sold ahead very generally for the next three months and in specific instances little new business can be booked for delivery before June. On many goods mills are sold ahead for the balance of the year.

The holiday business among retailers was excellent. This has been followed by great activity in clearance sales. The latter have been gratifying to the retailer in the sense that goods have been disposed of at a profit but not upon a basis of present replacement cost. In a number of instances cotton domestics have been selling at retail below the prices selling agents were getting for the goods at the mills. This anomalous condition is readily explained by the fact of the great rise in values last year within a comparatively few months. Retailers who bought at all liberally made a handsome profit on the rise and have been able to continue offering attractive prices to consumers in contrast with the values quoted by mills.

The time is at hand when both retailers and jobbers must elect to buy ahead for this year or adopt a policy to meet the new and very high prices now existing. Jobbers who have been in the New York markets since the first of the year have certainly been eager to buy and have bid the market up on themselves in their anxiety to secure prompt delivery. The optimism of many of these western buyers is not shared by many manufacturers and the tendency has been to sell on as short terms as possible and at the highest prices buyers will pay.

Despite many handicaps due to a shortage of labor that cannot be remedied until emigration increases from Europe or elsewhere, the mills are not able to run in full. Nevertheless, production is undoubtedly gaining steadily and from time to time additional goods are offered to customers. The demand has been so sharp that it has not been difficult at all to secure advances on any price fixed for a season. It has happened in this way that when agents have had to name new prices for general long delivery, say for a season or a part of a season, the new prices have showed an upward jump of 5 cents or even 10 cents a yard. Yet in the interval from the naming of the first price and the last, sales of small lots have been made at higher and higher prices, until the public comes to know with something of a shock just what has been happening through the insistence of buyers.

The menace that all manufacturers and all discerning merchants see in the present situation is the very wide profit margins existing at the producing end of trade. This is not only an abnormal condition but it is also believed to be a dangerous one. The manufacturer can stand a stiff shrinkage in value without suffering loss on goods but a merchant whose assets are all in merchandise feels the loss from the time the decline begins. The manufacturer will take his loss eventually in the decline in value of the raw materials he has on hand. He may also take losses due to inability to pay for the goods ordered by the buyer. If the decline is to be rapid the manufacturer will be confronted with the question of accepting a cancellation or a bad debt.

This condition of a wide profit margin at the producing end of trade has continued for a long time but its danger increases in proportion to the rise of prices to the consumer and the approach of the point where the consumer will be forced to resist advances by not purchasing. The point manufacturers make is that business would be much healthier if prices were not so high.

Manufacturers are not taking kindly to continued government publicity about profiteering as applied to them. Their attitude is that buyers have demanded goods and prices have been named in more instances by buyers than by the manufacturers. Until something is done to correct the inflation in money values and check the wild extravagance of popular buying, they do not see how investigations into producing conditions will help much. What they particularly resent is the apparent willingness of political investigators to attack corporations as profiteers and pass over the individuals in trade who are really the ones who have worked for high prices for profit without a corresponding effort to produce real wealth.

The finishing companies continue very active. Printers are flooded with work and tenders of new business. The wash fabrics trade has been particularly active and there has been a good export demand for many of the staple prints. Wherever it is possible to do so printers have been operating overtime but many of them are months behind their orders. A similar condition exists in piece dyes and nearly all kinds of heavy finishing. Bleached goods mills are so busy that they cannot undertake new deliveries within 60 days.

The miscellaneous textile business of the section is exceedingly active. Tape, braid, webbing, curtain, and other factories continue to receive more tenders of business than they can attend to. This is reflected in an unparalleled cotton yarn market, especially in fine yarns. Fabulous prices are being bid for fine combed yarns as high as $5.75 having been paid for 2-80s that a year ago were selling indifferently at $1.12.

Machinery building goes on as rapidly as men can be found for the work. Some concerns have a year's and others two years' business ahead of them and at prices from two to four times above pre-war values. Unquestionably the demands of the automobile trade has done much to change the old relations of supply and demand in this quarter.

The belief that heavy trucks traveling at a high rate of speed turn over where there is a tire blowout was entirely disproved by one of the transcontinental trucks of the Goodyear Tire & Rubber Co., Akron, Ohio, while traveling with the first California highway motor convoy recently. The truck was rolling along in excess of 30 miles an hour with a load of approximately four tons and was on an extremely rough detour when the left rear tire blew. There was no tendency of the truck to skid or keel.

A section of the Barrett Specification 20 Year Roof on West Technical High School, Cleveland, Ohio. It was laid over another type of roof that had begun to deteriorate after only seven years of service.

How to be sure of a 20-Year roof—

THE West Technical High School, Cleveland, Ohio, pictured above, has just been re-roofed with a Barrett Specification Roof *over another type of roof that had begun to deteriorate seriously after only seven years of service.*

When the Barrett Specification Roof was finished we handed the City Officials of Cleveland a Surety Bond, issued by the well-known United States Fidelity & Guaranty Co., of Baltimore, which **guarantees** the roof to last for at least 20 years without maintenance expense of any kind. The probabilities are that this roof will last nearer 30 years.

There is only one way to be absolutely sure of getting the kind of roof you want—a genuine Barrett Specification Roof—and that is to write this standard paragraph into the building specifications.

"The roof shall be laid according to The Barrett Specification dated *May* 1, 1916, and the contractors shall obtain for us, without additional cost, the Barrett 20-Year Guaranty Bond."

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Such expressions as "Barrett Specification *type* of roof," "Five-ply felt-and-pitch roof" or "Barrett Specification Roof, *or equal*," should never be permitted in a building specification.

The 20-Year Surety Bond Is Free

The 20-Year Surety Bond will be furnished on any roof of 50 squares or over, in cities of 25,000 or over, or in smaller places where Barrett Inspection Service is available. There is no charge for this Bond. Our only requirements are that the Barrett Specification shall be strictly followed and that the roofing contractor shall be approved by us.

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Cotton Comment.

BY H. AND B. BEER.

New Orleans, La., January 22nd, 1920.

Not withstanding the delay on the part of the United States in ratifying the peace treaty, which has already been ratified by the European allies, and further weakness in foreign exchange, cotton has held its own remarkably well during the past month. The demand for cotton goods remains urgent, and prices are at the highest level of the season. Mills are reported booked for six to twelve months ahead, and the same conditions exist in Manchester.

While goods have been advancing there is no appreciable change in the value of spot cotton compared with one month ago, therefore the spinners' margin has widened further. The lowest levels on record for foreign exchange have tended to restrict the demand for spot cotton in the South. However, the mills of the world have only taken a little more than half of their season's requirements, and, must, of necessity, buy freely eventually.

So far this season exports to Europe from the United States total 3,524,000 vs. 2,373,000 to even date last year, or 1,151,000 in excess of one year ago. Indications are that exports for the whole season will amount to about 7,000,000 bales.

American mills have yet to take freely of the raw material for further requirements, perhaps, approximately, 3,000,000 bales, as their takings so far this season figure a little in excess of 4,000,000.

Aware of these conditions, and of the scarcity of white cotton, southern spot owners are not at all concerned as to the ultimate future of the market, realizing that spinners must keep in the markets for their requirements, which are apparently large, and will likely buy freely again soon.

Ratification of the peace treaty by the United States, whereby America would take her place in the League of Nations, assuring the continuance of peace throughout the world, would be a stimulating trade influence, and would provide that confidence in the future, which is lacking at the moment. Ratification would remove all present war restrictions as to trading with Germany, would undoubtedly stabilize foreign exchange, marks as well as sterling, would open the door for credit extensions to European nations and would restore to the seas a resumption of world-wide trading. Just at present Washington is reported nearer an agreement on the treaty reservations, and it is possible that ratification may be an accomplished fact in the near future.

Meanwhile consumption of cotton, as predicted, is increasing on this side of the Atlantic, American mills having consumed during December 512,000 bales of lint cotton vs. 473,000 bales for the corresponding month last season, for the first five months of the season 2,551,000 against 2,394.000. That consumption in America is to increase further in the future is indicated by a further addition of active spindles last month of 110,000, bringing the total number up to 34,594,000 at the close of December against 33,658,000 last year.

Compared with one year ago mill stocks in the United States were 1,833,000 bales December 31st vs. 1,752,000, but stocks in public storage were only 4,146,000 compared with 4,671.000 or a total supply in America of 5,981,000 against 6,423,000.

As to the outlook for preparations for the next crop, returns are not encouraging, farm work is backward as a result of the wet winter and a scarcity of labor. Two or three weeks of dry weather is necessary to permit plowing to make headway. Concerning this year's acreage, indications are that it will be increased, but only to the extent made possible by the shortage of farm hands. In this respect, because of the scarcity of labor and renters, future weather developments will play an important part in the demining the size of this year's cotton acreage. Stocks will be reduced to the minimum by next August, and the world will need a large crop. Unless a large crop is produced this year, the world will likely face a famine in American cotton next season.

The Yarn Market.

The first few days of January brought a condition in the cotton yarn market hardly ever before experienced. The steady, though irregular, advance in prices of all counts, which had been prevailing for some time, was brought over from the last of December and in some parts of the list record-breaking prices existed as the new year came in. This is something that can hardly be remembered to have happened before at this time of the year. Practically every previous January has brought on a general lull in business in yarns as well as other commodities; and along with the lull has usually come some kind of a drop in prices, but such was not the case this year. The market weathered the holiday and inventory seasons with vigor and the hopes of those dealers who, with an eye on the chart of past performances, expected prices to ease off, were not fulfilled. Along the first of the month, however, these steady gains were made on the face of a somewhat slack trading, although the business placed exceeded all precedents.

Conditions during the second week were similar to those existing during the first week, with the notable exception of a greatly increased demand, coming from knitters and weavers. Prices continued to climb; in some cases counts were marked up as many as four times in the six days of trading. Southern yarns, notably carded skeins and warps, came to the fore as leaders of the week's advances, moving up one to three cents a pound and holding these new high levels throughout the week. On the other hand, northern spinners seemed less inclined to mark up rates than southern producers. All through the first week dealers specializing in these yarns had been urging them to "follow the suit" of their southern brothers, but with only one or two exceptions, the rises made were much more moderate than were looked for. The most active of the yarns in trading were the knitting type, although the others were well in demand.

With regard to business done and price advances, the third week was merely a repetition of the first two. For this period, according to houses doing a representative volume of trading, business has been considerably larger than ever before in the history of the market, for a similar period. This is all the more remarkable in view of prices now being paid as compared with those in effect during the boom in yarns three years ago, when all counts were moving at from 30 per cent to 65 per cent lower prices than those being paid at present. For example, in 1917, southern single carded skeins, warps and tubes, then believed to be at their peak, brought only 30 to 40 per cent

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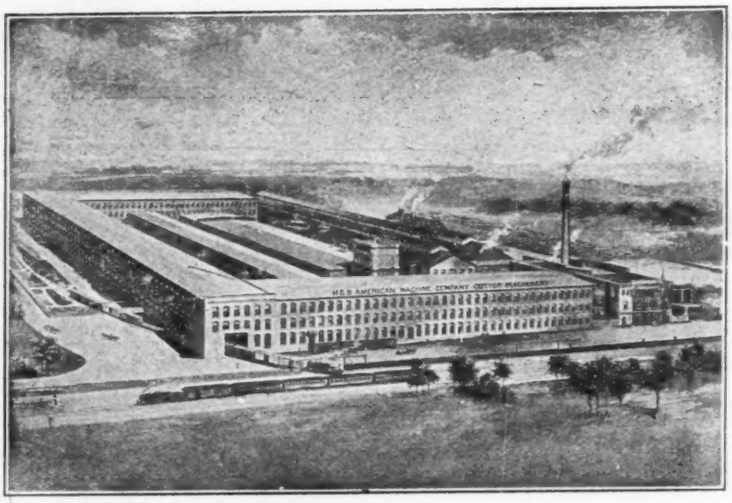

Spinning Room Machinery

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of their present prices; carpet and upholstery skeins cost them less than half as much now; carded ply skeins and warps sold on an average of from 33 to 45 per cent of prices paid for them this year, and hosiery yarns were 55 to 65 per cent lower than at this time.

However, when the business of these first weeks of the new year is described as "record-breaking," the application is to be made to the money involved. While it is true that the largest amount of money in history has been paid for yarns sold during this period, the quantities passing through the markets have not been so exceedingly enormous. The appearance of a big volume was accentuated by the high prices paid.

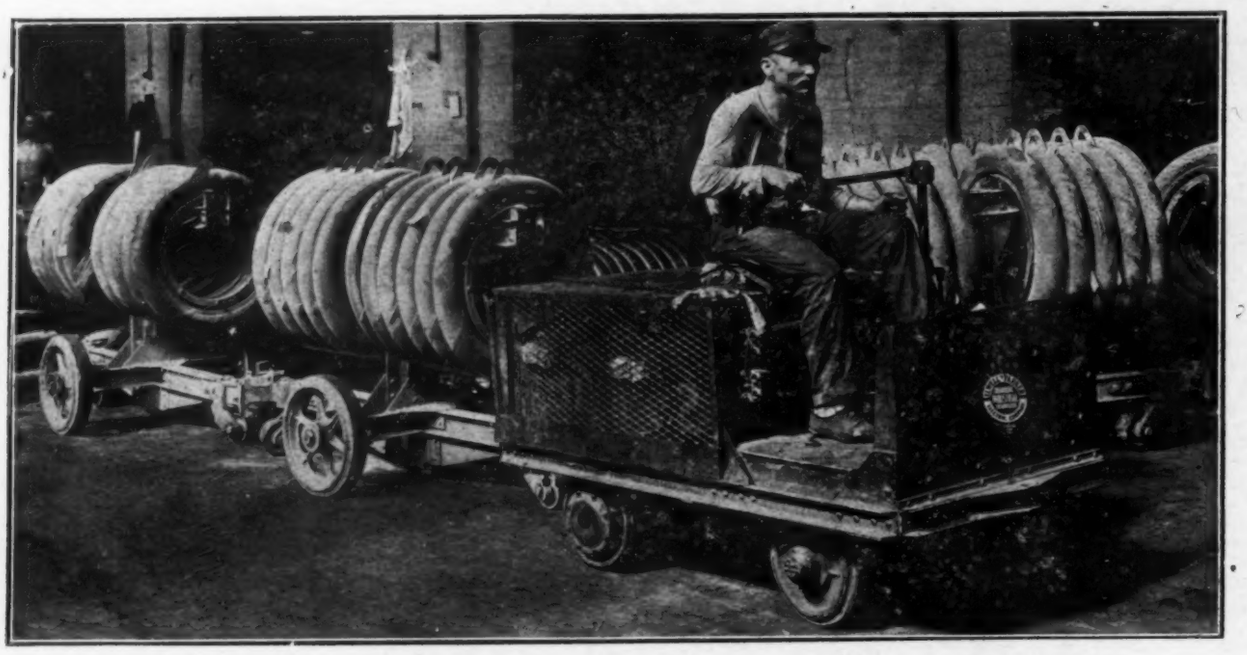
Notwithstanding this, there are many dealers, whose opinions may be accepted as representative of the rest, who estimate that if all inquiries received during this period could have been handled, the entire un-booked cotton yarn production of the whole country to next October would have been cleaned up. Supply could not be brought up to equal demand in some cases. It was even stated that some houses were, about this time, virtually off the market as regards much of their customary line of yarns. This was explained as being due, not so much to inability to place further business with their spinners as to difficulty in financing the movement of much larger quantities of yarn in the months when the heavier deliveries would become due.

A great deal of attention is being paid to the question of credits by those involved in the yarn market. Certain accounts are under close scrutiny in several yarn houses, the dealers being determined to protect their customers, and incidentally themselves, against over-extension at a time when the ordinary cost of doing business is amazing. And both profits and increased bank loans are absorbed in many mills merely to sustain the usual volume of business. In some cases, manufacturers who will not "trim ship" for themselves are being assisted in this process by their yarn dealers, and more than once during the month of January has been witnessed the spectacle of yarn houses positively refusing to book, for comparatively near deliveries, orders supported by small mills backed by a high credit standing and willing to pay almost any price for the yarn.

It may be expected, states an authority, that this policy will be extended into the next quarter, should prices continue to higher levels, which in all probability is what they will do. Prosperity seems likely to continue in yarn circles for some time to come, but there is nothing attractive about trying to look ahead further than 90 days. "Under present conditions it is just as bad to be too far-sighted as it would be to be short-sighted and the man who attempts to forecast conditions beyond next March is likely to go broke," said a member of a prominent Philadelphia firm along the first part of the month.

This may be considered as ultra-conservative, but it is expected by yarn men in Philadelphia that cotton will go higher than ever later in the year, and is taking into account the possible effects of a sixth successive short cotton crop, due to labor shortage in the South and a tendency among southern farmers toward a diversification of crops and a reduction of the acreage given over to cotton.

It might also be added that two-ply combed peeler skeins continued to stay at the head of the list when it came to taking upward price spurts.



ADAPT THE TRUCKS TO THE BUSINESS.

Following are recent quotations on the Philadelphia market:

Southern Single Skeins.

4s to 8s	.72	10s	.73
12s	.74	14s	.76
16s	.77	20s	.85
24s	.95	26s	$1.00
30s	$1.10@$0.15		

Southern Single Warps.

8s	.73	10s	.74
12s	.75	14s	.77
16s	.78	20s	.92 @94
26s	$1.02@$1.05	30s	$1.15@$1.20
40s	$1.65@$1.75		

Carpet and Upholstery Yarns in Skeins.

3-4 slack	.70 @71
9-4 slack	.71 @72
8-3-4 tinged tubes	.64 @65
9-3-4 hard twist waste	.64 @65
8-3-4 white twist warp twist	.70 @71

Southern Two-Ply Skeins

8s	.72	10s	.73 @75
12s	.75 @76	14s	.77 @78
16s	.82 @84	20s	.90 @92
24s	$1.00@$1.02	26s	$1.05@$1.10
30s	$1.20@$1.25	40s	$1.75@$1.90

Southern Two-Ply Warp.

8s	.73	10s	.74
12s	.76	14s	.77 @78
16s	.86 @87	20s	.92 @95
24s	$1.00@$1.05	26s	$1.05@$1.10
30s	$1.25@$1.35	40s	$1.85@$2.00

Two-Ply Combed Peeler Skeins and Warps.

20s	$1.65@$1.60	24s	$1.70@$1.80
30s	$2.10@$2.25	40s	$2.60@$2.75
50s	$3.25@$3.35	60s	$3.60@$3.70
70s	$3.95@$4.20	80s	$4.75@$5.00

Southern Frame Spun Carded Yarn on Cones.

8s	.73	10s	.75
12s	.76	14s	.77
16s	.78	18s	.79
20s	.80 @81	22s	.80 @82
24s	.89 @90	26s	.93 @95
30s	.98 @$1.00	40s	$1.50@$1.60
30s tying-in			.95 @$1.00
30s double carded			$1.05@$1.10

Northern Mule Spun Carded Yarn on Cones.

10s	.80 @81	12s	.82 @83
14s	.83 @84	16s	.84 @85
18s	.85 @86	20s	.86 @88
24s	.90 @92	26s	.95 @$1.00
30s	$1.10@$1.15	40s	$1.60@$1.65

Northern Mule Spun Combed Peeler Yarn on Cones.

10s	$1.12@$1.13	12s	$1.13@$1.14
14s	$1.14	16s	$1.16
18s	$1.18	20s	$1.20
22s	$1.22	26s	$1.30
30s	$1.54	36s	$1.92
40s	$2.00		

"Opportunity knocks but once at every man's door" and unless you're up and ready to answer that knock you're likely to lose your big chance.

Every Day Service Counts.

Here is a picture of the first electric factory truck ever operated at Goodyear and its driver, John Somody. For six years this truck has been operated in Department 150B and has traveled approximately 180,000 miles. Somody has driven it more than 75,000 miles.

The truck hauls a load of 3,100 pounds each trip, making a trip every four minutes about the department. In one eight hour shift it pulls over 200,000 pounds of tires and cores, doing the work that it formerly took 25 men to do.

In all, there are 25 such trucks at Goodyear. The three types used are the self-loading, the tractor and the flat freight.

The power used to run these electric trucks is supplied by two large storage batteries. It is necessary to make a change of batteries every eight hours. The tires used on the trucks are 5 x 15 Goodyear "S-V", and run on the average 40,000 miles before they are unfit for use.

The first issue of The Tech Engineering News, published at Cambridge, Mass., under the supervision of the managing board of The Tech, of the Massachusetts Institute of Technology, has made its appearance. This first issue is a very interesting one, is printed on nicely finished paper and contains 16 pages. It contains articles on various phases of engineering work, some of which are written by well known men who are executives in different industries of the country.

This new paper is edited and published by the undergraduates of the Massachusetts Institute of Technology. Its purpose is to provide a medium for the exchange of ideas between those directly associated with the school and men of executive rank throughout the country. It is said to be the first attempt which has been made in a publication of this kind to secure the attention and interest of both students and engineers and to interest them in each other. If The News accomplishes this, it will have filled a long and much desired need.

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Notes About Men You Know.

ALLEN F. JOHNSON, president of the Exposition Cotton Mills, Atlanta, Ga., tendered his resignation, effective February 15. It is understood that Mr. Johnson has accepted a position with a large manufacturing corporation which owns a number of mills in the South. Mr. Johnson has been president and manager of the Exposition Mills for eight years, having relinquished in 1912 his position as secretary and manager of the Milstead Manufacturing Company, at Conyers, Ga., to become connected with this institution. He served on the government cotton goods price fixing committee during the war as a representative of the American Cotton Manufacturers' Association. He has served two terms as president of the Cotton Manufacturers' Association of Georgia and is now vice-president of the American Cotton Manufacturers' Association.

ALLEN LITTLE has been elected president of the Kincaid Manufacturing Company, Griffin, Ga. Mr. Little has been the active manager of these mills for a number of years.

B. R. DABBS, a well known member of the textile selling fraternity in the South, has accepted a position with the United Chemical Products Corporation of Jersey City, N. J., and will travel out of Atlanta, covering Georgia, Alabama and Tennessee, as well as the states of the southwest with the aniline colors and chemicals of this company.

E. C. HENDRICK has accepted the superintendency of the Rhyne-Houser Mill, Cherryville, N. C. He was formerly overseer of carding at the Wiscassett Mill No. 6, Albemarle, N. C.

J. P. HARTSOE, formerly superintendent of the Linden Manufacturing Co., Davidson, S. C., has become superintendent of the Shaw Cotton Mill, Weldon, N. C.

J. O. EDWARDS has accepted a position as overseer of carding at the Lancaster (S. C.) Manufacturing Co.

A. J. MOORE has resigned as overseer of weaving at the Nokomis Cotton Mills, Lexington, N. C. G. W. Chaney, formerly at Winston-Salem, N. C., has accepted the position as overseer of weaving, slashing and warping at these mills.

G. A. FRANKLIN has resigned as superintendent of the Riverside and Toxaway Mills, at Anderson, S. C., to accept a similar position with the Sibley Mills, Augusta, Ga. Mr. Franklin, who has been superintendent of the Riverside and Toxaway Mills for the past four years, will be succeeded by Major Jesse T. Crawford, local manager of the Riverside Mill, Pendleton, S. C. Major Crawford was a very popular member of the 30th Division, A. E. F.

C. S. MORRIS was elected president of the Salisbury (N. C.) Cotton Mills at the recent annual meeting of the stockholders of the company.

JOSEPH H. SHINN, JR., formerly Philadelphia manager of the United States Conditioning and Testing Company, is now associated with the United States Wool Company, of Denver, Colo., as general manager with offices at 207 Chestnut Street, Philadelphia, Pa.

B. R. DICKSON has resigned his position with the Beaver Mills, North Adams, Mass., and accepted a position as overseer of carding at the No. 4 Mills of the Berkshire Manufacturing Co., Adams, Mass.

Z. B. DOBY has resigned as master mechanic at the Buffalo Mill, Union, S. C.

J. SMILLY, formerly with the Grant Yarn Co., Fitchburg, Mass., has become overseer of carding at the Beaver Mills, North Adams, Mass.

S. J. HOOKS, president of the Piedmont Finishing Mills, Burlington, N. C., has resigned this position to take charge of the Bismark Hosiery Mills, Carthage, N. C.

G. GURNSEY has a position as overseer of carding at the Hoosic Cotton Mills, North Adams, Mass. He was formerly with Berkshire Mills No. 4, Adams, Mass.

H. C. LONG, JR., has resigned as secretary of the Park Yarn Mills, Kings Mountain, N. C., to become secretary and local manager for the Rhyne-Anderson Mills, Troy, N. C.

H. G. WINGET, formerly superintendent of the Dunn Mill, South Gastonia, N. C., has assumed charge of the Victory Mill, Gastonia, N. C.

WILLIAM D. HANNAN has resigned as overseer at the Cannon Manufacturing Company, York, S. C.

J. McC. BARKSDALE has resigned his position as secretary of the Lydia Cotton Mills, Clinton, S. C. Mr. Barksdale was a lieutenant colonel in the army during the war and saw overseas service in this capacity.

ROBERT O. ROBERTS has resigned as traveling representative of the Draper Corporation, Hopedale, Mass., and accepted the position of manager of the Danville Knitting Mills, Bon Air, Ala., succeeding John T. H. Lewis, resigned.

H. A. WOODHEAD has accepted the position of agent for the Calhoun Cotton Mills and the Woodstock Cotton Mills, Anniston, Ala.

J. H. HOOK has resigned as superintendent of the Denison (Texas) Cotton Mills.

J. F. COMER has accepted the position of agent for the

Alexander Cotton Mills, Alexander City, Ala., succeeding W. A. Giles.

J. T. BLACKMON has succeeded W. P. Hurt as superintendent of the Magnolia Cotton Mill, Charlotte, N. C.

W. D. SHERWOOD has accepted the superintendency of the Blue Ridge Cotton Mills, Connelly Springs, N. C.

JOHN W. WHITE has accepted the position of master mechanic at the Washington Mills, Fries, Va. He formerly held a similar position at the Eva Jane, Central, Katherine and Sallie B. Mills, Sylacauga, Ala.

H. P. HUNT has been appointed overseer of carding at the Pomona Mills, Greensboro, N. C. He recently was discharged from the service after eighteen months' service overseas.

C. R. ROBERTS has accepted the assistant superintendency of the Tifton (Ga.) Cotton Mill. He was formerly connected with the Atlanta Textile Co.

LEWIS A. MACLAUGHLIN, formerly assistant to the vice-president and chairman of the sales committee of E. F. Houghton & Co., of Philadelphia, has rejoined the Fletcher Works staff and will apply himself to research and sales promotion work in the centrifugal division. Mr. McLaughlin was formerly advertising manager of Schaum & Uhlinger, Inc., and Atlas Ball Co., and general sales manager of the Tahara Company of America. The change took effect on January 19.

B. S. PIPER has resigned his position as overseer of weaving for the John H. Meyer Duck Co., Newark, N. J., to accept a similar position with the Mason Fabric Co., Kent, Ohio. Mr. Piper is a well known Georgia boy and for many years was an erector for the Stafford Co., Readville, Mass.

I. B. COVINGTON, superintendent of The Florence Mills, Forest City, N. C., has returned to his work after being confined to a hospital for six weeks because of a very serious operation.

W. IRVING BULLARD, textile manufacturer, banker and publicist, was recently elected vice-president of the Merchants National Bank of N. Y. Mr. Bullard has been associated with the Merchants National for the past three years, having established in 1917 the textile department, now known as the industrial service department, of the bank. He is particularly prominent in the textile industry, being a director of several cotton mills, treasurer of the National Association of Cotton Manufacturers and, with Sir James Hope Simpson of England, joint treasurer of the World Cotton Conference. Last year, Mr. Bullard was a member of the special commission representing the American cotton industry which was sent to Europe to invite personally the leaders of the European cotton industry to the World Cotton Conference at New Orleans, and to assist in textile reconstruction problems in the devastated countries of Europe.

H. L. WHITMAN has been appointed superintendent of the Beverly Cotton Mills, Middleton, Ga.

B. O. JOHNSON has resigned as overseer of weaving, winding, warping and slashing at the Piedmont Commission Co., Charlotte, N. C., and accepted a position as overseer of weaving at the Southern Asbestos Manufacturing Co., of the same city.

J. B. EZELL has accepted the position of superintendent of the Altamahaw (N. C.) Cotton Mills.

B. D. GADDY has been appointed superintendent of the knitting plant recently installed at the Golden Belt Manufacturing Company, Durham, N. C.

R. W. GIBSON has become overseer of spinning at the No. 1 Mill of the Republic Mills, Great Falls, S. C. He was formerly carder and spinner at the Kershaw (S. C.) Cotton Mills.

"WE NEED THE BUSINESS" is the title of a new book by Joseph E. Austrian, published by Frederick A. Stokes Company, 443 Fourth Avenue, New York City. The author, through his leading character, "Mr. Citron," has pictured the whole busy life of the "Ready-to-Wear" trade. This is told in a series of inimitable letters that are full of humor—conscious and unconscious—overflowing with shrewd philosophy, and contain a running fire of comment on competitors, trade conditions, rival salesmen, "lady buyers" and other features of the great "Ready-to-Wear" industry. It is a book that will be appreciated by the majority of business men. It may be secured direct from the publisher, through COTTON, or from the nearest bookstore at $1.00 net.

The Franklin Process Company, Providence, R. I., has purchased from the Gorham Manufacturing Company of the same city the plant of the latter company which, up to the time of the signing of the armistice, was used for the manufacture of shells and Stokes bombs. The new owners contemplate using the plant to manufacture their dyeing machinery.

The main building of this plant is of four stories, 60 x 220 feet, to which the Gorham Manufacturing Company added a new building 51 x 150 feet. Connected with the main building is a three-story brick building and in addition there are four more buildings for storage and an office building. All the buildings are equipped thoroughly with sprinklers and up-to-date heating and lighting. The total floor space available for manufacturing and storage purposes, exclusive of office space, is 98,000 square feet.

The present plant of the Franklin Process Company will continue to be operated, but the increasing demand for the company's dyeing machinery made added floor space necessary.

Portable belt conveyors for handling material horizontally or at a slight incline are described and illustrated in a new folder "Type B Portable Belt Conveyors," recently issued by the Portable Machinery Company, Passaic, N. J. This folder contains prices of these machines which, in addition to being used for handling coal, sand, crushed stone, fertilizer, etc., are being used for conveying many manufactured products.

A drinking fountain in which the water will not fall back upon the jet and in which the jet is protected against mouth secretions and germ-laden dust is the "Quickool," manufactured by the Central Brass Manufacturing Co., Cleveland, Ohio. The ice chamber of this fountain is heavily galvanized iron. A special iron casting, galvanized inside and out, takes the place of a coil. This said to insure more refrigeration than is obtainable by the use of a coil and entirely eliminates the trouble of coils bursting.

The Irving National Bank and the Irving Trust Company, Woolworth Building, New York City, are sending out an attractive 1920 calendar on each sheet of which is an unusually good sky line photograph of the city of New York.

BLEACHERS!

There is an S O S call from your Selling Agent for Peroxide-bleached goods!

The Super wants them turned out p. d. q!

No time to study up on the question!--

Better get the dope from us before the call comes, don't you think?

Peroxide advice free to mills.

THE R. & H. CHEMICAL COMPANY
100 William St.,
NEW YORK, N. Y.

NEWPORT DYESTUFFS

NEWPORT TRADE MARK

We are manufacturing a very extensive range of high quality dyestuffs for all purposes.

Many of these dyes were known under a great many different names in the pre-war days. Before applying for import licenses, let us have your inquiry as we may now produce the color you require.

NEWPORT CHEMICAL WORKS, Incorporated

DELAWARE CORPORATION

PASSAIC, NEW JERSEY.

BRANCH SALES OFFICES:

Boston, Mass. Philadelphia, Pa. Providence, R. I.
Greensboro, N. C. Chicago, Ill.

How Other Men Manage

Practical Discussions by Cotton's Readers on all varieties of Mill Subjects

Two Questions for Carders.

EDITOR COTTON:

Will you please publish the following in your Practical Discussion Department?

After re-clothing a card doffer and cylinder, is it advisable to set the flats and have them grinding while the cylinder and doffer are grinding? If not, why not?

Should the cylinder and doffer be ground by using a traverse grinder or by a dead roll, and why in either case?

A Night Overseer (Mass.)

Read Trade Magazines.

EDITOR COTTON:

In such times and with such difficulties as we are at present contending with—the unrest between capital and labor in which a happy medium has not been reached—we should practice cooperation from which we would derive greater production.

The habit of manufacturers in holding aloof from the workmen is gradually becoming a thing of the past. I have noticed recently the "get-together" meetings of the owners and workmen, comparing ideas and suggestions. Where this is practiced very favorable results are often obtained. To get the workman to realize that his firm is interested in his welfare is sometimes hard to accomplish, but if it can be accomplished, good results are certain to follow.

Here is an instance with which I am personally acquainted. A manufacturer who takes a decided interest in his overseers and operatives in general had a number of magazines coming into his office monthly. In reading over these various magazines, he would from time to time find suggestions that were helpful to many of his foremen. He passed these books on to different ones so they could get what benefit there was to be derived therefrom. The attitude of some of the foremen was resentful to his practice, some even remarking that it was meant as a reflection on their work—to show up their shortcomings.

But these men looked at it in the wrong way. These helpful suggestions were for the man's own good. If he would grasp the new ideas, and put them into practical use, it would make that man more efficient and would increase his worth to his employer, thereby helping the worker himself in an indirect way.

These men should not think their employer is not interested in them. When they have a difficult problem to solve, or a suggestion they think will be beneficial to the management, let the manager know of it. Cooperate. They should show their employer that they are interested in his welfare. He proves he is interested in them or he would not keep them. If a man thinks he is not as efficient in his work as he should be, he shouldn't be discouraged. No doubt his superior has books or magazines that would be of assistance to him and would gladly let him have them. He should ask.

There has been a far too distant relationship between the owner and the skilled worker in the past, and by these two factors cooperating with each other, the barrier separating them will be broken down and interest will be created on both sides. A mutual understanding will crop up; a satisfactory feeling that life is worth while when both parties are pulling the same way and the results will be beneficial to all concerned. Bob (Iowa.)

A Certificate of Working Interest.

EDITOR COTTON:

Efficiency has been well called the worker of miracles. How can the efficiency of workers be so increased as to make present high wage rates economically practicable?

Efficiency is changing the lives of thousands of men and women all over the world; is changing them from struggling with wasteful methods, with worried days, with uncertain action, to sure progress and success.

To make high wage rates economically practicable, we should have homogeneous service; we should create a bonus system to serve as an incentive; and every employee should be a holder of a profit sharing certificate.

Homogeneous service can be attained by the use of a well prepared pamphlet of instructions. These pamphlets would be distributed among the employees and one given to every hand when he enters the employ of the mill. Such instructions would treat on how successful work depends entirely upon the manner and mental attitude in which the employees do their work, and not upon the number of times the operation or work has been performed.

It should be clearly pointed out in these instructions that if an employee performs a certain operation in a mechanical way, that is, unthinkingly, the work is not necessarily completely successful, no matter how many weeks he or she may have been engaged in doing this very work over and over. But if an employee, by careful thought and manipulation, can either economize in time on any machine or eliminate unnecessary motions, the operation will be successful regardless of the actual period taken on the work or the number of times the worker has performed the operation.

In the first case, the worker is allowing his physical powers to gain precedence over his mental ability, and consequently in a short time he will become merely a part of the machine which he operates. The latter case shows operatives alive to their opportunities, making the simplest operations successful.

We must have the machine, human or mechanical, which delivers with maximum efficiency and minimum waste—which operates at the greatest possible mental and mechanical speed with the fewest errors, in order to make high wage rates economically practicable.

All employees should be taught that a great deal of the joy of life consists in doing to the best of one's ability everything which he or she attempts to do. There is a sense of satisfaction, a pride in surveying such a work—a work which is rounded, full, exact and complete in all its parts—which the superficial person who leaves his or her work in a slovenly, shipshod, half-finished condition can never know.

In the office, in every department, and visible everywhere, should hang the sign, "Good Service." It should always be kept before the heads of the departments who demand, or should demand, good service from their employees in all positions. When an error is made by a young or inexperienced person, instead of criticism and harsh words being used, the good service sign should be pointed out to him and the question asked, "Do you think you gave good service in this instance?" The idea would be to impress on the mind of the employees that good service is what is wanted today and that good business comes through service. One operative may put in the same number of hours as another, yet with nothing like the same amount of production. Yet each may do what he calls a day's work as they have no common standard for the work.

Most of us have "a reserve margin of efficiency" which is not known or understood until some incentive is created. By a bonus system and production standard this has often been proven in cotton mills and other shops and factories.

For the sake of illustration, if a weaver is given two or three cents per cut for producing the maximum standard production, this bonus would serve as an incentive and the resulting production would lower the cost per pound, as the larger the production, the larger the profits.

The profits of any concern depend to a great extent upon the attitude which the employees take toward their work. The total cost of employees paid by the hour or day is high, because the employees on piece work do not operate at the greatest mental speed. Therefore, a true spirit of cooperation and loyalty must be established in their minds. But it is not natural for them to accept these views just to help the employer. They must be made to see that harder work, greater cooperation, higher efficiency and loyalty are the means by which *they themselves* can get ahead and that what helps the employer helps the employee.

Profits, in the ordinary sense of the word, instead of being contrasted with, should to a large extent be classified with wages. In fact, the wages paid for the superintendency and management of a mill should be recognized elements in the classical analysis of profits. Following is one form of profit sharing certificate which could be adopted by almost any concern:

(Name of Concern)

$500

Certificate of Working Interest

This is to certify that ..... is entitled to an interest in the business, to the extent of the profits, subject to the conditions and stipulations contained in this agreement for year and amount as stated below.

1. That this working interest and share in the profits is given in consideration of faithful, continuous and efficient service during the period specified, and it is distinctly understood that only those who continue in the employ of the concern until the date of payment and by faithful and efficient work assist in earning a profit will be entitled to share therein; and that any employee who is discharged, or who leaves the employ of the company during the time of this agreement, forfeits all rights under same.

2. That the judgment of the management or superintendent shall be final as to whether the character of each person's work entitles him to a share in the profit under this agreement. Every employee must do his best to make a profit in order to share therein.

3. That it is to be distinctly understood that no liability of any kind, either as to debts or losses, is incurred by the holder of this working interest and that no capital having been paid in no rights are conferred to the principal, but only as to the profits on the above amount of capital.

4. The amount paid on this certificate will be the average percentage made by the three preceding years upon the total manufacturing investment, plus the wages. Payment will be made during the month of December in each year.

5. The amount of the working interest will be fixed solely by the management, but will be based upon a maximum yearly increase of $50 for each year's continuous and faithful service. The maximum amount of the working interest will be approximately the amount of the yearly wages of the employee.

6. This certificate is not transferable. Payment will be made only to the person named herein.

This profit sharing plan would satisfy all employees and they would resent a change from it, once it was established.

The changing class of help, ignorant and careless, is the cause of much industrial waste. To my mind, the form of certificate shown is the only remedy, and would surely serve as an incentive to all employees and make high wage rates economically practicable. The whole plan is in line with efficiency. The mill takes no chances, as a profit must be realized to make it operative.

Contest Letter No. 6. Wash (Conn.)

Cutting Costs.

EDITOR COTTON:

There is perhaps one most important question to be discussed in your prize contest and that is the question of cutting costs.

Belting repairs of all kinds should be looked after closely, for with the present high price of leather, only a small belt will cost many dollars. Keep all belts tight enough so that they will not slip and burn up the face for when the face of a belt becomes burnt, the belt is of little service afterwards. Keep some kind of good dressing on the belts so as to make them soft and pliable and avoid slipping. One cannot exercise too much care with belts, whatever methods are used. The results of keeping the belts in good condition will show on the supply bill at the end of the year.

Suppose we go through the mill and see what we can do to cut costs. Many mills drive the picker machinery by individual motors fastened directly to the machine framing. As the pickers and openers were among the first kinds of textile machinery to be individually driven, therefore, there is more data on hand concerning their power requirements than for most of the other kinds of machinery.

In the card room the group drive is used in preference

Time Extended on the Prize Contest

Because of the delay in the January number, it has been decided to extend the time for the close of the Prize Contest one month, making the closing date March 31st.

As the largest monthly textile production journal in America, COTTON is anxious to tell its many readers what the other fellow is doing to aid in this work of increased production. Therefore, it is offering a First Prize of $20.00 and a Second Prize of $10.00 for the two best suggestions received between December 1st, 1919, and March 31st, 1920. All acceptable letters will be published in that Department of COTTON entitled "How Other Men Manage" and will be paid for at the regular rate whether or not the article wins a prize.

Mill men desiring to compete for the prizes should describe in detail the methods or practices adopted, showing drawings or sketches where necessary and giving results in actual figures where possible. The name of no mill will be mentioned and no indication as to the identity of the author of any article will be given other than the name of the state where he is located. The only exception as to the authors' names being the two prize winners which will be announced in the May, 1920, number of COTTON

There is no limit to the number of articles a contestant may submit and the accomplishment described need not be in his own mill or department, although he must necessarily be thoroughly familiar with all the details and results in order to successfully write about them. Articles may be sent in at any time between the dates named and should be addressed to The Contest Editor of COTTON, Atlanta, Ga.

EMPLOYERS LIABILITY INSURANCE AT COST

During the year 1918 the MILLERS INDEMNITY UNDERWRITERS made a saving of 27% on Liability Insurance for Southern Textile Mills. We are now figuring on the rate of saving for the year 1919, just closed. This saving will be approximately 30%. When you realize that our rates are practically the same as those charged by other Companies, you will appreciate what our organization has meant to its policyholders.

We are now making a special appeal to the Georgia Mills to give us their co-operation. Many of them have already done so, especially those that had representatives at the annual meeting of the Georgia Cotton Manufacturers Association in Atlantic City last summer, when the matter of insurance was discussed.

Our Southeastern Office is at Atlanta, within easy reach of the Georgia mills. We solicit the inquiries of those mills interested in reducing insurance cost.

MILLERS INDEMNITY UNDERWRITERS

BAILEY & COLLINS, Managers.

920-21 Atlanta Trust Bldg., Atlanta, Georgia.

to individual motors. Carding is a continuous operation with practically no stops except for grinding and it does not require direct drive like the pickers and openers. The following table shows the power required for revolving top flat cards, temperature, 70 degrees, Fahrenheit; relative humidity, 65 per cent; revolutions of cylinder per minute, 165.

TABLE.

Pounds production per day of 10 hours.		Horsepower		Weight of Card sliver in grains per yard.
40 in. mach.	45 in. mach.	40 in. mach.	45 in. mach.	
72	80	0.8	0.8	36
81	90	0.9	0.9	38
90	100	0.9	1.0	40
99	110	1.0	1.1	46
108	120	1.0	1.1	48
126	140	1.1	1.2	52
133	148	1.1	1.2	56
142	158	1.2	1.3	60
159	177	1.2	1.4	64
171	190	1.3	1.4	68
180	200	1.3	1.5	72
198	220	1.4	1.5	76

So many different conditions affect the power used by speeders and spinning frames that it is impossible to establish any definite values as correct, so I will not undertake to do it here. With mule spinning 90 to 125 spindles may be operated per horsepower. Warpers require about one-quarter to one-half of one horsepower per machine, and slashers one and one-half horsepower each.

While speaking of the savings made by keeping machinery clean and in good running condition, I may well mention the rapidly increasing use of compressed air for cleaning textile machinery. Compressed air has been used for this purpose to a small degree for some time and during the last few years experiments have been made which prove plainly the many advantages which may be obtained through the use of this method of cleaning.

Very few textile mills realize the importance of giving careful attention to the power used in driving the spindles of the spinning frames. The amount used to rotate one spindle is not much, even in the worst cases, but when we multiply this by many thousands the amount is so great that it is worthy of consideration. Any change which will decrease the horsepower per spindle is worth trying. The power consumed in causing a spindle to rotate is used to overcome friction. This friction varies greatly according to the type and size of the spindle used, but in all cases care should be taken to reduce this friction to a minimum. The simplest machine in a textile mill requires careful use and attention in order to do its work in the proper way and should not be neglected. The amount of twist given to yarn might seem a very simple thing in itself and yet now important a part this plays. The same principles hold true with the steam engine indicator and unless small matters are considered the results will be far from correct.

Prize Contest Letter No. 3. Through the Rubs (N. C.)

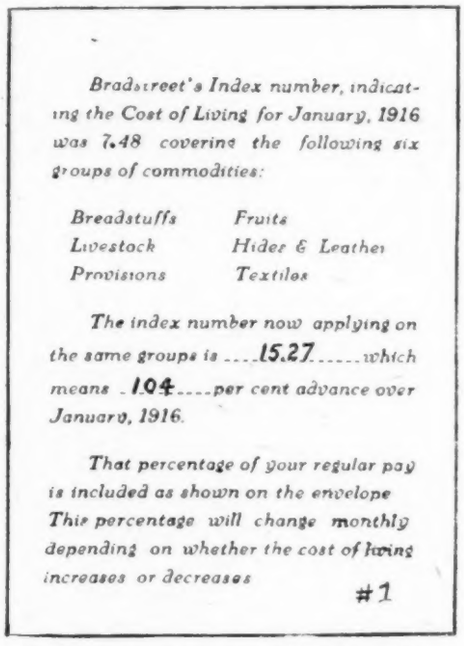
One defective process in the system of textile manufacturing may cause the material, when it becomes a finished product, to be rejected by the prospective purchaser. Is there any one department in your mill which is not up to standard?

The Index Number Wage System.

EDITOR COTTON:

On first reading the conditions of your prize contest I gained the impression that what you wanted was a suggestion or "kink" that might be applied to any of the various processes of manufacture to shorten them and thereby increase production. As you propose, however, to publish these suggestions under the heading "How Other Men Manage" I am presuming to offer a suggestion that will not stimulate production by shortening any of its processes but will, I am sure, be a producer by reason of the fact that it will create happiness and contentment amongst the employees, thereby enabling them not only to do more work but better work.

Within the past few years employers throughout the


Bradstreet's Index number, indicating the Cost of Living for January, 1916 was 7.48 covering the following six groups of commodities:

Breadstuffs	*Fruits*
Livestock	*Hides & Leather*
Provisions	*Textiles*

The index number now applying on the same groups is 15.27 *which means* 104 *per cent advance over January, 1916.*

That percentage of your regular pay is included as shown on the envelope This percentage will change monthly depending on whether the cost of living increases or decreases

#1

FIG. 1. CARD FOR THE PAY ENVELOPE.

improving working conditions between the management and the men. Briefly summed up, the plans most worthy of notice have been:

1st. A revival of the various employees' profit sharing schemes.

2nd. Industrial Democracy. A much talked of plan originated by John Leitch and adopted by a few companies in various industries.

3rd. The Index Number Wage. A wage payment system which fluctuates with the changing cost of living.

The last mentioned plan was probably first used by the Oneida Community, Ltd., Oneida, N. Y., and while it has not received as much publicity as the other plans, it is deserving of careful consideration. This plan, with modifications, was adopted by our company on May 25, 1918, with results that have been most gratifying.

The plan may be defined as a bonus system, the bonus being determined by the advance or decline in the cost of living. In introducing this scheme it was necessary to select a regular or Base Wage for each job, or in other words, determine a wage on which the bonus should be

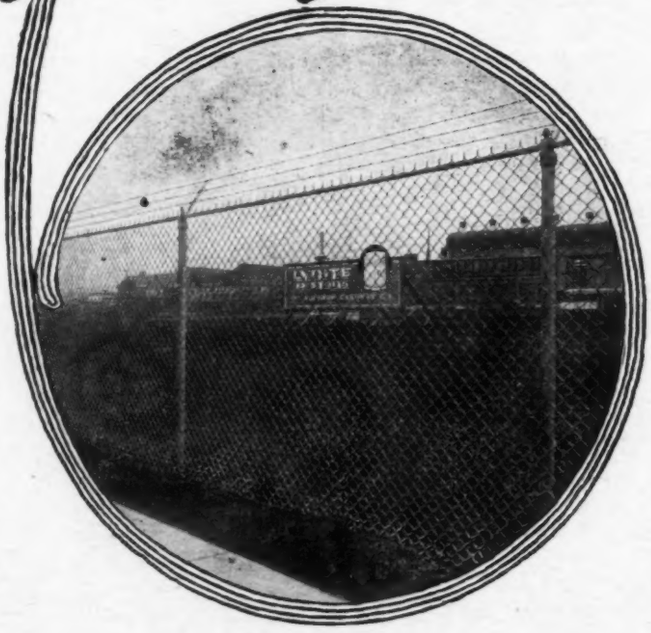
=playing in your yard?

A Mob Never Could Were It Anchor Post Protected

An Anchor Post Chain Link Factory Fence forms an unclimbable, unburnable stockade that cannot be pulled down or broken through. It is an ever vigilant watchman, on duty all day and all night.

Heavy galvanized to prevent rust and corrosion, each post is securely anchored in a manner that prevents sagging or uprooting. Actual experience has proven these Anchor Post Fences as serviceable after ten years use as the day they were erected.

Telephone or write our nearest office. An interesting catalog and intelligent cooperation will show you how economical a good fence is.



ANCHOR POST IRON WORKS

Atlanta Office: Atlanta Trust Co. Bldg.

New York Office: 167 Broadway.
Philadelphia: Real Estate Trust Building.
Hartford: 902 Main Street.
Cleveland: Guardian Building.
Chicago: Hartford Building.

2267-G

Anchor Post Fences

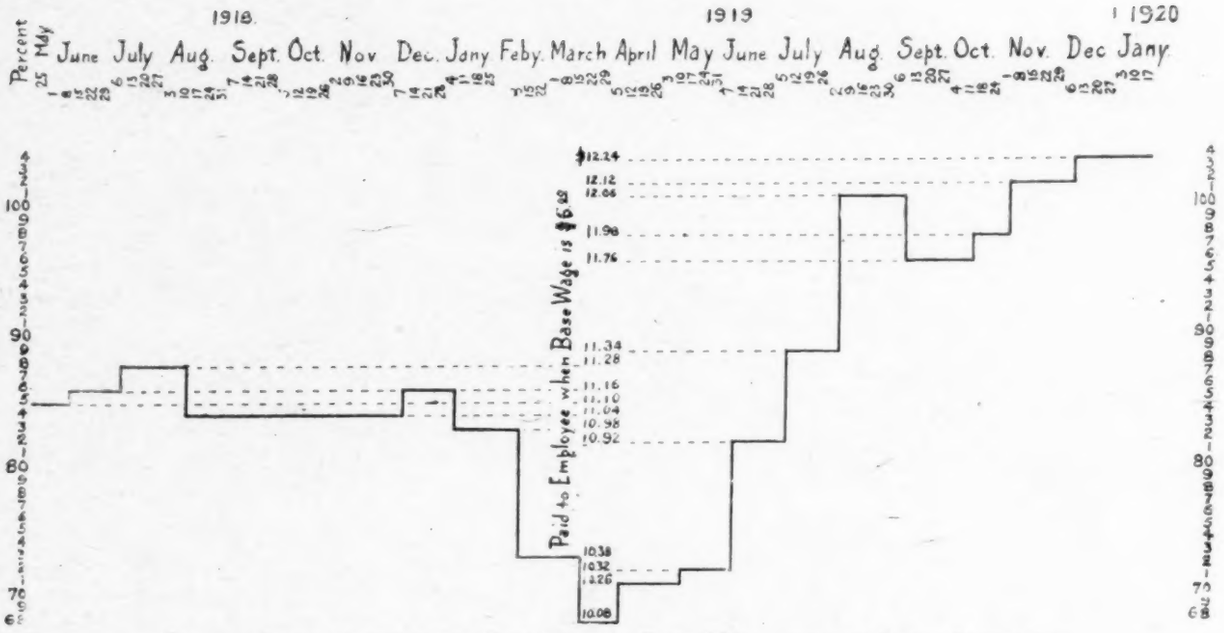


FIG. 2. CHART SHOWING PER CENT PAID ON BASE WAGE FOR THE PERIOD INDICATED.

paid. The rates of pay in force January, 1916, were selected as the Base Wage because up to that date there had been no noticeable increase in the cost of living and wage earners were generally paid commensurate with living costs. It was also necessary to choose an accurate and fair method of determining the percentage of increase or decrease in the cost of living.

A satisfactory method for this was found by using Bradstreet's Index Number. For the benefit of those who are not conversant with this Index Number it might be explained that for seventy-five years or more Bradstreet's Commercial Agency has published monthly what it terms an index to the cost of living. The Index Number may be defined as follows: A sum total of the cost per pound in the most favorable markets of something more than one hundred commodities that enter into the cost of individual living. These commodities are grouped under the following thirteen headings:

Breadstuffs	Metals
Live Stock	Coal and Coke
Provisions and Groceries	Mineral and Veg. Oils
Fresh and Dried Fruits	Naval Stores
Hides and Leather	Bldg. Materials
Raw and Mfgd. Textiles	Chemicals and Drugs

Miscellaneous

We did not use the whole number as given by Bradstreet's but only the items covered by the first six groups, the other being discarded as not directly affecting the operatives. A comparison each month of the Index Number for the first six groups with that for the same groups in January, 1916, will show the percentage of increase or decrease in the cost of living.

The weekly payroll is made up by taking each worker's Base Pay and increasing it by the percentage of increase in the cost of living. A card (Figure 1) which shows the operative exactly how his pay was calculated is enclosed in the pay envelope. As will be seen from the card, the Index Number for January, 1916, was 7.48. The Number applying January 1920, is 15.27, showing an increase in the cost of living of 104 per cent. Using this percentage with a Base Wage of $6.00 per week the calculation would be $6.00 Base Wage plus 104 per cent or $12.24 total pay.

When the plan was first inaugurated on May 25th, 1918, the Index Number applying was 13.83, showing an increase in the cost of living of only 85 per cent.

The workings of the plan can best be illustrated by a graphic curve (Figure 2) which is plotted to show the monthly variation of the percentage paid on the Base Wage. The numbers shown on the ordinates of the curve and directly under the months are the dates of the Saturdays or Pay Days in that month. The numbers on the abscissas are the percentages. The figures in the center of the chart show the actual weekly earnings of an employee whose Base Wage is $6.00 per week. It will be noticed that in several instances the break in the curve occurs at the end of three weeks. This is due to the fact that the Index Number is published in Bradstreet's weekly publication issued nearest the 15th of the month.

It is realized that the plan might be more scientifically administered but we have simplified it as much as possible in order to make it more readily understood by our operatives. As a rule they do understand and appreciate the plan, as evidenced by the low rate of labor turnover on the sharp decline of percentage in March, 1919. We also realize, however, that no matter how excellent the plan may be we could not hope to follow a continued decline in percentage unless our competitors for labor were at the same time making similar reductions in their wage scales.

If our plan, or any other system of pay based on living costs, could be put into universal use it would not only give wage earners advances to meet present conditions but would provide for an equitable reduction when the cost of living declines. H. R. S. (South Carolina.)

Under the rough finish of some of your operatives there are possibly some good ideas or suggestions which would aid in keeping your mill in good running condition. Ever give them a chance to show themselves?

The Fellow Who Says:

"What You Don't Know Won't Hurt You"

may be right in a

Dairy Lunch

but he's all wrong

in business.

Isn't he?

Then, so that you may know the story of Manufactured Weather in the Modern Textile Mill (more than 200 of them now) write to me today and ask me to send you my new book "Weather." It's gratis, of course, and I'm right proud of the way in which my thousands of friends have received it. They say it tells 'em the real dope without a lot of technical camouflage.

Why don't you

Write right now?

Yours to make

"Every day a ***good*** day"

The Mechanical Weather Man

Specialists in Manufactured Weather,—Humidification, Heating, Ventilation, Purification, Positive Automatic Control of Atmospheric Conditions.

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Warp Preparation.

EDITOR COTTON:

Those in charge of yarn and warp preparation in a colored goods mill using raw stock dyes sometimes have troubles all their own. We will consider a mill making 1300 end ginghams dyed in the raw cotton. To begin with, cotton of the proper grade as to color and length of staple should be selected according to the fineness of the numbers to be spun. Then if it is good clean cotton free from leaf and other dirty substances it may be used direct from the bale to the dyeing machine. If cotton is very specky and has much foreign matter mixed in it, it pays to run this latter through pickers into laps before dyeing. The result is cleaner yarn and better production through the after processes in mills.

In the dyeing of raw stock it must be borne in mind that it is only by chance that even the very best master dyers get out two batches that would spin separately and then match up alike. To overcome these batch troubles, as a rule, it is the better way to have plenty of room to spread out each separate batch as it comes from the drier, spreading one on top of another until the desired amount of stock has accumulated. If a blower system is in use, take the cotton from the pile, top to bottom, which will help mix the batches into one blend.

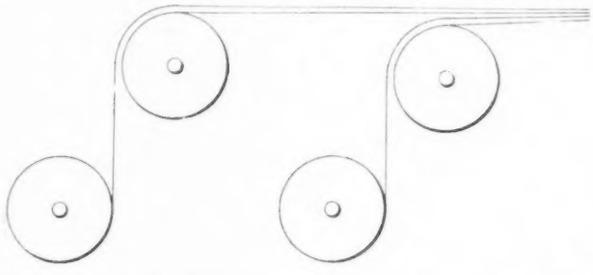
It is now ready for the picker, and the carder is supposed to put it into laps of a certain weight per yard. So that it will eventually reach the spinner, in a roving of so many grains per yard, to be spun into yarn 26/1 and filling, say, 32/1. If in running this cotton through the card room process, the roving came out almost the correct number, then the spinner will be able to deliver the yarn in about the right number, but as is the case at some mills very often numbers and weights do not keep where one wishes them. Then trouble arises later on.

This yarn is now ready for spooling (one process that is sadly neglected in many mills). These frames should be kept in good running order, with a speed of spindles according to the size of the yarn and diameter of the spool head. If knotters are used in spooling, someone in charge should see to it that the operators do not let the thread go onto the spool without first pulling back the kink or slack place. This is one bad fault that is often not looked into enough. The writer knows from experience that some of these snarls will stay in the yarn through warpers, and if they do not break out a bunch on slasher, the weaver gets a pick out or a float which means seconds.

We next come to the warping. This is regular section beam warping. In the creel the wood pegs should be all of one diameter to insure an even tension. The stop motion should be in good working order. The speed not too fast. The expansion combs with the proper number of teeth so as to have no empty dents in the make-up of a sheet of yarn. See that the section beam is equally divided on the cylinder and that weights are even on both ends. Also see that all warper indicator rolls are of the same circumference, so as to avoid waste at the end of the sets. The clock or wrap should be set at the beginning of each beam. Now if this yarn has been handled o. k. up to this stage, the next process, slashing, should be very easy to handle and warps from this lot should make good cloth providing the filling is all right.

We will now consider the results of uneven work all through the carding and spinning processes. The writer will give an example of what does happen when one gets yarn that is supposed to be, say, No. 26/1. In a mill like the one we have in mind, sometimes there is a surplus of yarns left over, and on spools, of a certain color, it probably weighs No. 24/1 instead of 26/1. It may have been on hand several months. The superintendent gives orders to work this in with what is being spun at present; the overseer does not think of weighing it up, and the warper tender places it all in solid in the creel along with the lighter counts. The result is that when this set is put in the slasher the trouble commences. The coarse yarn rolls off slack from the section beam, twisting into strings on the cylinder and breaking out bunches on the loom beam at the front of the slasher. This trouble could have been avoided to some extent by finding the difference in the counts and placing the coarse yarn throughout the creel, or scattering it across the 54 inches instead of putting it in solid on one end or in one place, but it is best that numbers do not vary to that extent on any kind of work.

The question arises at times as to how many sections to make for a slasher on 1500 ends. Four beams is the proper thing, and if on pattern work with say six colors and two of these colors called for one-half of the 1500 ends, that would mean two solid beams. The remaining four colors would be warped on two combinations or indent beams according to pattern. Again there is a right and wrong way of placing these same beams in the slasher creel according to the style of raddle one uses on the front of the slasher. As a rule we try to get the small colors on the top of the sheet at the front. The beams can be placed in the usual



way one under and one over. Then again on fancy pattern work, or on half white and half color, beams are best placed at the back as two separate sets, as shown in the sketch. They are easier to separate on the front when run in this way.

The size rolls should be nicely covered with a good cover on the finishing or front size rolls. The friction roll on the front of the slasher should have enough cloth on it to take care of the tension on the yarn sheet.

There are several styles of combs used in slashing. Single combs with a strong spring and heavy gauge wire teeth. A 350 would do for this kind of work with about six ends in a dent, making any kind of a pattern from a two and two up to any sort of broken patterns. Two lease rods (of steel) are used on the front of this comb to separate the colors that happen to come in the same dent, according to pattern. When this pattern is laid in and the slasher is going, one has a beam that looks just like a piece of cloth; every thread is just where it should be and if it is desired to make the drawing-in more sure, a string can be put in (on the slasher just before stopping to doff) between the small colors, so that there can be no twisting of

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The economy of this feature of S K F Hangers is better appreciated when it is understood that in the average textile mill using line shafting for power transmission friction in the hanger bearings destroys approximately 25 percent of all the power produced or bought. This saving is practically impossible with bearings which do not compensate for shaft deflection.

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one color around another as is sometimes done on a very heavy sheet of yarn.

Then there is the double comb, which has two rows of pins and about 800 dents. These combs are very limber. The sheet is laid in two ends in a dent, which means four, as the four that goes in the back row is separated by the front row. These combs have a tendency to contract at the sides making a loom beam soft in the center and piling up the yarn on each side. This is caused by the spring being soft and the wire of too small gauge to get 800 teeth in the place of, say, 400 teeth. The yarn comes onto the front of the machine at 54 inches and through the comb sometimes at 32 inches, the yarn pulling in the dents.

There is still another slasher raddle on the market which the writer has never used. It is an expansion comb, but different from all others. But the comb most used is the regular single comb, as a first-class slasher man can do so many different styles on one comb.

The sum total is to get things going in the right way at first, each one watching and doing his full part in all departments and making things easier and smoother for the next process until it reaches the cloth room in such shape that the manager cannot help but remark, "We have fine organization." The writer claims all these points can be, and are being accomplished in many mills today.

Mac. (Georgia).

Flowers and the Workers.

EDITOR COTTON:

I notice your discussion pages of late seem to be full of different subjects on textile work and the thought occurred to me that just a few lines on "flowers" would not be out of the way to mix in with the regular run of discussion, as flowers work wonders around the mill.

In considering the subject, we will go outside of the mill to get our discussion started, in order to show what and how much it embraces.

We all know that the mill managements have done more and more every year for the benefit of their employees in the way of schools and churches, and also in playgrounds and school yards, grading and leveling such yards and fixing flower gardens. The superintendent or principal has this in charge and special instructors educate the pupils along these lines of work at recess and after school hours, letting them work in the flower gardens.

It is sometimes asked where the mill succeeds in getting results therefrom? It is this way, the pupils take the flowers grown in the school garden to the home and are full of ambition and interest in getting the cuttings to grow. So they get after their parents to get them some flower pots. The parents, who probably never cared for flowers in their lives, will see the anxiety of the child and get the pots. After this it will be but a short time before the parents will then take to the flowers.

By and by, as time goes on, the children who cared for the school gardens will leave the school and go to work in the mill, and being accustomed to caring for flowers, and trying to make everything beautiful around their homes they will have pride in their surroundings and will show the same neatness and carefulness in their work rooms as they did at school. Raise the children to work among flowers and they are more apt to be better in all their dealings, honest and clean and mindful of their duties.

This has been my experience after a study of nearly four years and I can see a wonderful difference in the type of youngsters who have passed through this system of schooling and have entered the mill for work. It seems to brighten and cheer them, and their temperaments are more easily controlled, for the simple reason that their homes have been made more beautiful and homelike and they think more of them.

In the winter comes the work of caring for the permanent flowers. The mill in question, where this system has been inaugurated, has gone to the expense of putting up shelves in the windows of the mill for each and everyone who has flowers they wish to care for during the winter. Those who have flowers carry them in, two and three pots at a time as they go to work, from day to day until they are all in the mill. The plants are watered at the required times, and are kept beautiful all through the winter. The mills are generally warm enough to give the flowers the usual advantage of being in a hothouse. Every person who has flowers in the mill is interested in keeping them living and takes pride in them, and waters them and sees that no one interferes with them. Having that pride, they naturally have more pride in their work and they will work more regularly. The fear that while they are out, some mischievous chap might damage their flowers, causes them to be on hand every day. Also, it beautifies the rooms to have the flowers scattered around through the mill in the windows.

This movement embraces almost every family in the mill. They all have flowers, more or less, and especially if they have a place to keep them during the winter. The winter has always been a drawback on the family, where there was at their homes no cellar or pit in which to keep them. They did not have many and did not care to bother with them. Take a family with a nice collection of flowers to care for, and which they feel proud over, or a good flower yard with an assortment of roses and other flowers, and there is not much moving about with them. It gives them something to feel good over and brings contentment. Consequently the children being raised up in this manner are not of a roving disposition and are more self-respecting.

This is not theory. It is being put into actual work and is proving out as described during the last four years or more and is getting better every year, developing more interest in the younger generations, which is evidenced when the child becomes old enough to enter the mill.

I just thought I would get this subject off my mind and give it to the readers of COTTON, for those acquainted with this system have seen its fruits and those who have not tried it should begin at once this line of training on the children before they get old enough to work.

Some mill men will say it is of no use, that help don't stay long enough for an education of this kind. But let them start it and see. Some of the workers may move away, but the thoughts of these advantages will be on their minds so they will soon want to move back, and generally, when they come back, they are through with moving for a while.

The condition of every mill village is either attractive or unattractive. Make the villages, the school and the church attractive and by and by the mill will be just as attractive. The cleaner the homes the cleaner the help are at their work. You never see help who have clean homes

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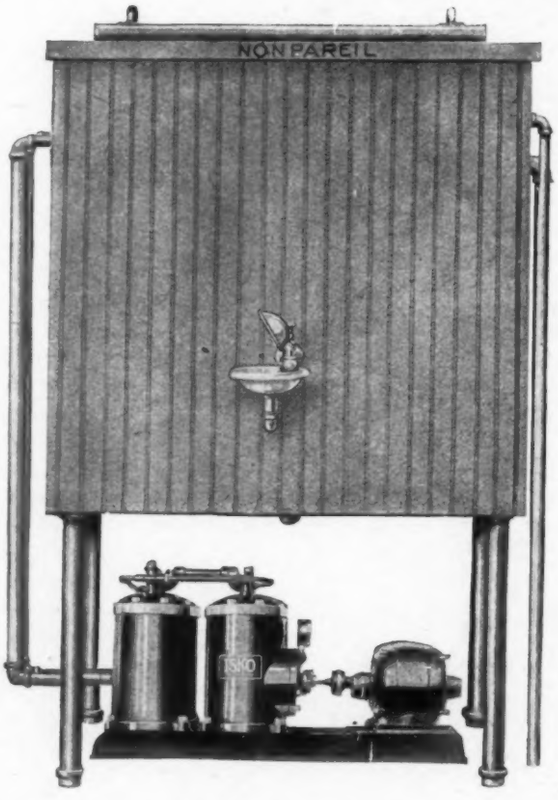
The ISKO drinking water unit consists of an ISKO refrigerating machine mounted under, and direct connected to a water storage tank so as to operate as an individual unit.

This unit can be placed on the top floor of the building and the cold water supplied to the various floors by gravity.



The ISKO refrigerating machine is the simplest, most compact, and most durable refrigerating machine ever designed. There are but two moving parts in the machine. The compressor is a rotary gear pump with two small gears which revolve on ball bearings and are completely submerged in oil.

This pump represents an advance in compressor design that is the marvel of the engineering world.

Cold Drinking Water at Convenient Points in the Factory.

Cold drinking water, easily accessible from Sanitary Fountains at convenient places throughout the factory will prove a dividend payer for it builds up the efficiency of the working force in a marked degree. It is becoming recognized as an essential part of the equipment of an up-to-date Cotton Mill or Factory.

This unit will deliver 100 gallons of water chilled from 75 degrees Fah. to 50 degrees during each ten-hour day.

The ISKO refrigerating machine is made in larger sizes which will take care of greater demands. Specifications and descriptions of these larger units will be furnished by our engineers on request.

SOUTHERN STATES SUPPLY CO.

ATLANTA COLUMBIA GREENVILLE JACKSONVILLE

and good yards and gardens, but they are just as clean and careful about their work in the mill.

Think it over. Look around your village, flower gardens, etc., and see if the idea is worth while. I can say that it is after four years' experience in a village with a population of 3,000 and with 1,000 cotton workers in one mill.

Carder (Ga.)

A Good Roll Varnish.

EDITOR COTTON:

I recently noted a request of a mill man for a good roll varnish and I take pleasure in submitting the following formula, which has proven very satisfactory to the writer:

Place a certain amount of powdered glue in a jar, and add enough acetic acid to equal the amount of glue. Let this stand until well dissolved. Pour enough of this mixture into a bowl so as to half fill the bowl. Next add chrome green paint. Stir this mixture well.

Dip a forefinger into this mixture. If no sticky feeling is noticed when the finger is pressed against the thumb, add more of the glue and acid mixture. If the liquid is too thin, add more paint.

Apply one coat of varnish and let stand until dried. Then apply another coat, and when this is dry, add a third coat. In the case of new rolls that are not to be used immediately, apply one coat only. When the rolls to be varnished are needed at once, apply the two next coats, as stated. If three coats are applied and the rolls laid away and not used, the surface will crack, which makes the rolls almost useless.

If a large draft exists on the machine, use barn door red paint instead of chrome green. Wash (Conn.)

The Vat Dyestuffs.

EDITOR COTTON:

In general we use the name vat-dyestuffs for those which are insoluble in water, acids and alkali and which through reducing-agents in an alkaline soluble state in the so-called "leuco-body" are converted and which on the other hand through an oxidation process can be transformed back to the insoluble original dyestuff.

The vat-dyestuffs do not require any special mordant or after treatment to be fixed on the fibers.

In dyeing technology the vat-dyestuffs are taken as one group, but from the chemical point of view they do not form a family of their own. There are differences in their chemical constitution and they are classified into the following groups:

1. The group of Indigo and its substitutes.
2. The group of Thio-Indigo and its derivations.
3. The Anthracinon vat-dyestuffs.

The vat-dyestuffs are, as is well known, of great value to the textile industry. A very short time ago vat-dyes had only one representative, the Indigo, which in the dyeing and printing field, even in the chemical circle, had been more or less an isolated part; but there are now many vat-dye-stuffs on the market. They represent the entire scale of colors, and all practical shades on any class of fibers may be produced with them.

The invention and introduction of the first vat-dyestuff is due to the Badische-Anilin and Soda-fabrik of Ludwigshafen, Germany, with their Indanthrens. Kalle & Co. of Biebrick, Germany, followed second with Thioindigo—red and scarlet. Shortly after this the Farbenfabriken of Elberfeld, Farbwerke Heoscht, and The Society of Chemical Industry, Basle, Switzerland, introduced their products and then came Cassella & Co. The reason which made the vat-dyestuffs so important is on account of the fastness of the shades produced with them, particularly with regard to washing, light and chlorine. In regard to this fastness there are great differences and it is advisable to make careful tests before selecting. In figuring out the cost of using vat-dyestuffs their fastness must be taken into consideration in order to stand a comparison with the expense of dye-stuffs of other groups.

The handling of vat-dyestuffs depends a great deal on practice. My successful working method for straight types and in special mixtures is to figure on these dyestuffs, which as a rule are in paste form, as a concentration of 20 per cent. The necessary amount of dyestuff and an equal amount of soda-lye well mixed, then I add the same amount of hydrosulphite powder and stir up until there is no more change in the color, when with an addition of hot water the solution is completed and ready to be put into the dye vat.

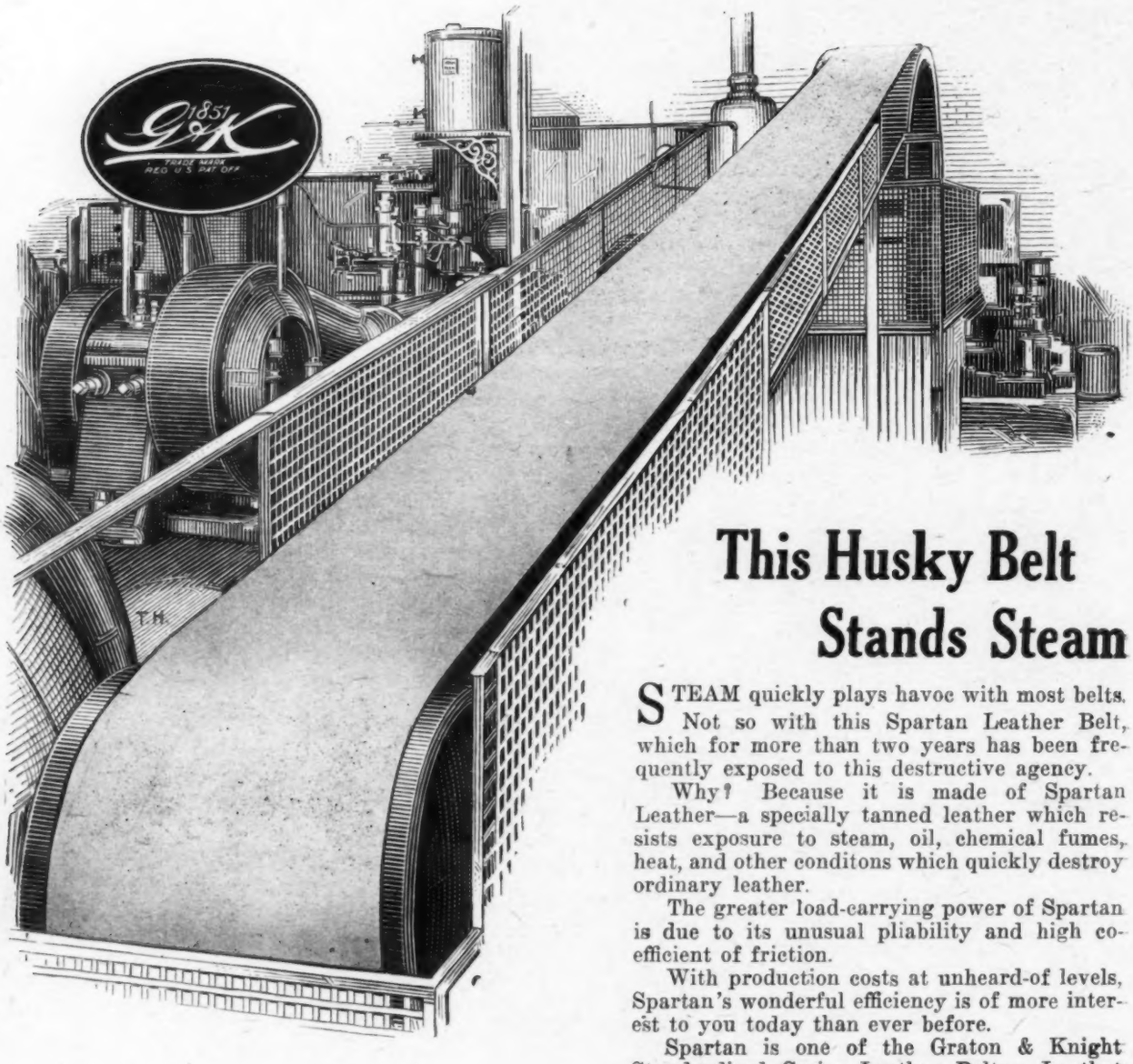
To secure results in different shades it is important that in this process, the temperature in particular, the dyeing time and the strength of the dye-liquor should always be kept under the same conditions.

In the dyeing of cotton, wool and silk a few dissimilarities are to be observed. Cotton may be dyed at any temperature, while in dyeing wool and silk the temperature should not be more than 140 degrees Fahrenheit as both classes of fibers may easily be destroyed above that temperature. Cotton, as usual, must be boiled out, and the wool well scoured before dyeing. Only wooden tanks should be used in the dyeing. When preparing a new bath, for correcting the water add about 2 quarts of soda-lye and 2 pounds of hydrosulphite per 100 gallons of water. Add the necessary amount of dyestuff dissolved as described and enter with the goods. Work under slow handling from half an hour to one hour. For producing light shades use $\frac{1}{5}$ to $\frac{1}{3}$ more of the above mentioned qualities of soda-lye and hydrosulphite; for medium and dark shades, an addition of Glauber salt or common salt to the dyebath will promote the exhaustion of the dyestuff. A little Turkey red oil added to the dyebath is always an advantage. After rinsing give the cotton a soap bath near the boil.

In the dyeing of wool and silk care must be taken that the dyebath is not too alkaline and for these two fibres after the dyeing and rinsing, an acid bath from lukewarm to boiling may follow. By using vat-dyestuffs, the fibers are in no way affected. On the contrary, the wool has a softer feeling than when dyed with chrome colors.

The Indanthrene dyestuffs are suitable for cotton and silk. They represent the whole color scale with the exception of a very bright red. The shades of their blue types are most fast to light on cotton or silk.

I have had little experience with the Thioindigo colors, having used only red, scarlet, orange and brown.. The Thioindigo colors were for cotton, wool and silk. The Thioindigo-red B was an easy level-dyeing color, and very fast. It also works very well in combination. This dyestuff can be dyed with the addition of sulphite of sodium.



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STEAM quickly plays havoc with most belts. Not so with this Spartan Leather Belt, which for more than two years has been frequently exposed to this destructive agency.

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The greater load-carrying power of Spartan is due to its unusual pliability and high coefficient of friction.

With production costs at unheard-of levels, Spartan's wonderful efficiency is of more interest to you today than ever before.

Spartan is one of the Graton & Knight Standardized Series Leather Belts. In that Series, there is a belt standardized for every drive. Write for our book, "Standardized Leather Belting."

The advice of our Engineering Department is at your disposal on any power transmission problem. Ask us questions about belts and their uses and treatment.

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Leather Belting

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like the sulphur colors, and through this is formed the only red-sulphur dyestuff I know of.

The Algole colors of the Farbenfabriken represented the whole scale of colors with pure shades and in general very good fastness. Cold temperatures were used in the dyeing process of these colors.

The Society of Chemical Industry, Basle, (Klipstein & Co., U. S. A.) has also a whole scale of colors with their Ciba and Cibanone dyestuffs. The Ciba colors may be used on all fibers but the Cibanone colors only on cotton and silk. One of the types is Cibanone-black B which has a very bloomy shade and a fastness which cannot be gainsaid. Cibanone black B is a cotton black I have found to be fast to chlorine. The Ciba blues are well adapted as substitutes for Indigo as their shades are clearer and somewhat faster to chlorine and to cracking.

Another vat-dyestuff goes under the name of Indigo-yellow 3 G, which is a very bright greenish yellow and in regard to the light-test takes a position in the line of vat-yellows of the first quality.

It is seldom that a dyer takes a part in this discussion section and in blazing the path I hope to lead the way for others. Probably no section of the textile industry has more problems than the dyehouse. We dyers are always "up against" some kind of a proposition. If each reader, who is a dyer, would write a letter telling of his experiences with difficult problems and how they were overcome, we would soon have a department of our own that would be second to none in interest. A. A. (Penna.)

Good Running Work Means Contented Labor.

EDITOR COTTON:

At this writing the majority of the operatives in our cotton mills are very fussy, and even a cross look from the "boss" is liable to start something. There is nothing that will place an overseer on the wrong side of the fence any quicker than a bad running room. If the work runs well, the overseer is usually master of the situation; if not—goodnight.

However, it must be admitted that many overseers are to blame for bad running work. The most common cause for bad running work in cotton mills is the wrong tension on the fly frames. The writer has pointed out in previous letters that a tight tension always exists in a bobbin-lead fly frame. I gave as a test: Raise any bobbin gear so as to cause a certain amount of slack on any end, then start the frame and it will be found that this slack is taken up immediately. This is proof that continual stretch takes place, and should serve as an incentive to all readers in charge of fly frames. Watch the tension every minute and save the spinner a great amount of piecing.

I offer the following explanation to prove that the tension of fly frames should receive the closest attention at every opportunity. After years of hard work and study, it was found that if a bobbin of roving increased in diameter from one inch to one and an eighth inch, the proportionate increase was one-ninth part of the total diameter, but if the bobbin increased from three and seven-eighths inches to four inches, the proportionate increase was only one thirty-second part of the total diameter. Therefore, it was clearly realized that if the strand had the same number of fibers in its cross section throughout the length wound on the bobbin the equal increase of one-eighth of an inch in diameter of the bobbin was only equal in addition and was very unequal in proportion. To obtain the intermediate speeds, the cones must be considered as a continuous string of pulleys connected together, and in finding their true outline, each layer added to the bobbin of roving must also be considered separately, and the diameter of the cones figured for that layer alone. The result is a concave upper cone and a convex bottom cone, which gives the cones their peculiar formation—the most essential feature of the cotton roving frame.

Now with these facts in mind, and we must admit that all slivers on the card and drawing frame vary, and the finished drawing must be changed every little while, what happens when light or heavy work is wound on a fly frame bobbin? As stated, in order to have a perfect tension, the strand must be equal throughout its length, a condition that is an impossibility. If there is a variation, then the intermediate speeds caused by the formation of the cones is not of the same relationship to the surface speed of the front roll and we have either a slack or tight tension.

Again, changing the speed of the frame will destroy the proper intermediate speeds, for the reason that the amount of pressure at the termination of the presser finger is governed by the presser rod attached to the hollow leg of the flyer. The greater the speed, the greater the pressure to a certain extent. If the cotton is fluffy, it will not condense the same, and this, too, will destroy the proper intermediate speeds.

Different types of flyers and different hanks will also destroy the relationship of the surface speed of the front roll and bobbin. In fact, I believe tension on fly frames is often sadly neglected. These factors I believe prove that they can and do destroy the effect of the true outline of the cones, which calls for a different rack gear in each case. In closing, I wish to state that merely changing the rack gear will not cure all the evils pointed out, but will help some. Wash. (Mass.)

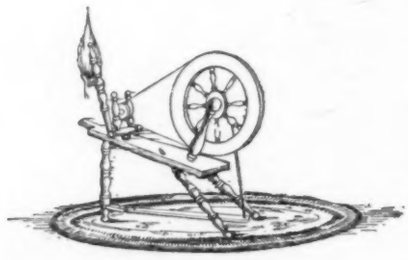
Kapok and Its Hazards.

BY CHARLES E. WORTHINGTON.

The increasing importation and use of "kapok," known also as silk floss, tree cotton and silk cotton, have aroused considerable apprehension as to its fire hazard both intrinsically and in comparison with other fibres.

Under its native Javanese name of kapok the fibre has been extensively used and greatly valued from remote times in tropical countries. It was first brought to European attention commercially during the latter half of the last century (1850 and later) chiefly through the efforts of the Dutch government. The government early adopted it as a standard material for stuffing army mattresses, cushions and life preservers, which action was soon followed by similar action of the German government. Aside from these countries, but little in the way of consumption of kapok is recorded in Northern Europe, it having for some unknown reason failed to receive popular approval.

In the United States its principal use has been for mattress making, for which purpose it possesses some very favorable characteristics, such as lightness and great elasticity. It is also slow to absorb moisture and odors, and shows little tendency to pack and harden.



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Experiments were made in an early stage in its use for stuffing life preservers, but with such indifferent success that its use for that purpose was temporarily forbidden. This prohibition has been since removed and the use of kapok is now specifically required.

Kapok is the fibre surrounding the seeds in certain trees of the *Bombax* group found throughout most tropical countries. The trees are of considerable size. The seed pod in arrangement of seed and fibre and in general appearance bears a strikingly close resemblance to the pod of the common milkweed (*asclepias cornuti*) found growing freely in the United States and Canada. The pods when ripe are gathered and broken open by hand and the seeds separated usually either by threshing above a latticed floor or by ginning machinery.

The fibre is then dried on an open floor under shelter, and compressed for shipment by hand or power presses in burlap covered bales. The bale generally in use for transatlantic shipment is the "double" bale of about 16 cubic feet and weighing approximately 200 pounds. The fibre is highly compressed for shipment.

The fibre itself under the microscope is a simple cylinder (most fibres are compound), with a large continuous cavity except for occasional closure at one end. The outer walls are hard and smooth, having neither hooks nor corrugations, and do not adhere to each other so as to "felt" or mat; in fact, they appear under some conditions to repel each other to some extent. Kapok possesses an unusual and permanent lustre.

As might be inferred, there are numerous varieties (the *Bombax* group includes over 50 species), which differ considerably among themselves in many respects and qualities, but many kinds of the fibre so closely resemble each other in general appearance as to be distinguishable only by trained experts.

Most of this material imported into the United States comes from Java, the Philippines, Cochin China, British India and Africa. The Java and Philippine product is obtained from the tree *Ceiba Pentandra L.* (*Ceiba*—Canoe, from the use of the wood by the natives in canoe building; *Pentandra*—five-leaved), which is found mainly in Java, the adjacent islands and the Philippines, the other varieties from several species of *Bombax*, chiefly *Bombax Malabaricum*. *C. pentandra*, however, has been found growing in tropical America and Florida, and the fibre was known to the early Spanish settlers as 'Ceiba."

Java and Philippine kapok is very light. It is said to be capable of sustaining twenty to thirty times its own weight in water, while cork sustains but six times. Comparative weights of this and all other varieties are not at present obtainable in authentic form, but a comparison with some other fibres (animal and vegetable) published by the Dutch government may be averaged and quoted as follows to show the number of pounds required to fill a given space when stuffed in, as in a mattress:

India kapok	27.1 lbs.
Java kapok	18.7 lbs.
Horsehair	27.5 lbs.
Seaweed	34.1 lbs.
Excelsior	35.5 lbs.
"African fibre"	27.5 lbs.
Straw	55.3 lbs.

The principal use is in stuffing mattresses, cushions and life preservers.

The original experiment of stuffing life preservers in the United States is said to have been with kapok from British India. The first great test came at the loss of the *General Slocum* in East River, New York, when the preservers proved inadequate, and the use of kapok for that purpose was for the time discontinued and, as already stated, forbidden. Subsequent experiments, however, resulted in a complete reversal of the unfavorable verdict, and the government now *requires* all life preservers to be stuffed with Java or Philippine kapok.

The fibre, which is shorter than cotton and of less strength, has been woven into cloth in Germany by the Chemnitzer Actien-Spinnerei after what is said to be a somewhat complicated preparation formulated by Goldberg, both alone and in combination with cotton and other fibres. It appears to take dyes well and retains its lustre, the yarns and plushes especially being soft and very handsome, resembling artificial (cellulose) silk. A Philadelphia firm has also been able to utilize the fibre in weaving draperies.

The cleaned seeds are used in making oil, which is said to be largely used as an adulterant in Oriental pennut oil, soap making, cooking oil, etc. The cake is fed to cattle and, it is said, occasionally roasted and eaten by the natives. The fibre from the bark is twisted into rope, the wood used for canoes and in tanning, and a red gum which exudes from the growing tree is said to possess medicinal qualities, as also are the crushed leaves and roots.

Analyses show about the usual percentage of ash, mineral and water and about 3 per cent of wax, this latter content probably varying greatly. Nothing in the available data suggests any unusual inherent combustibility.

As before stated, the walls of the fibre are perfectly smooth and cylindrical, thus preventing it from felting or matting, *i.e.*, permanently compacting. There seems also to be a disposition (probably electrical) of the fibres to become somewhat repellent when exposed to sunlight, so that a quantity which has been considerably compressed speedily regains its bulk and lightness when so exposed.

Kapok cloth when rubbed lightly develops about the same degree of frictional electricity as hard rubber, readily attracting small pieces of paper, etc.

The fibre absorbs moisture very slowly and only to a limited degree. The absorptive qualities of Indian kapok are said to be much greater than those of the Java and Philippine varieties. It dries rapidly after wetting, without losing its elasticity. Like all other fibres of its class, it is a non-conductor of heat. It is also said to retain no odors and to afford a minimum harborage of vermin—both sanitary qualities of value.

Most, if not all, of the Java kapok comes through Amsterdam. No very recent statistics are obtainable, but the total export of the Java product to the Netherlands increased from 1,000 tons in 1889 to 7,750 tons in 1909, while that of India kapok increased from 1,250 tons to 8,500 tons in the same period.

Re-export to America was in 1903 less than 100 tons of the Java product, a maximum of 400 tons being reached in 1907, followed by a decline of 200 tons in 1909. Since that date the American consumption has been greatly increased.

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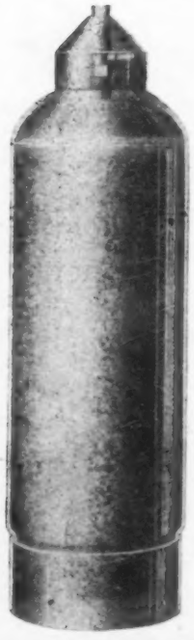

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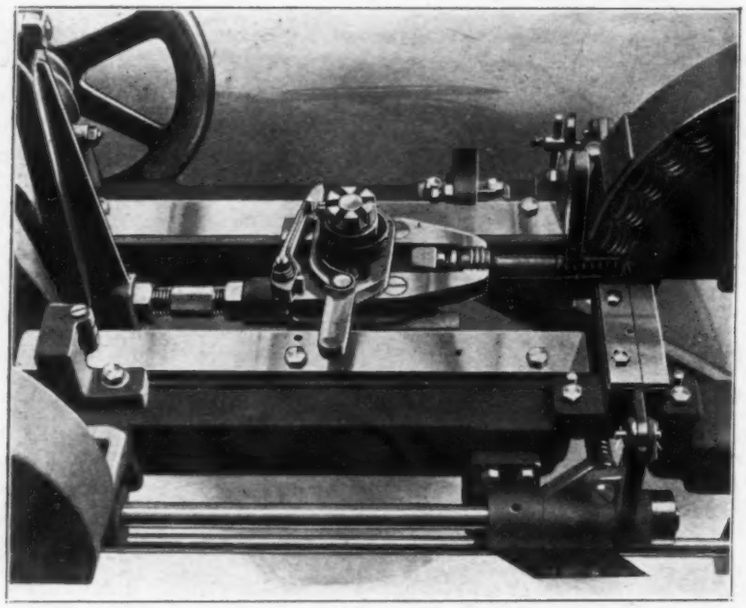

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In mass kapok is very combustible and ignitable by ordinary sparks. When a pile is ignited the fire spreads very rapidly in the loose superficial fibre—quite as rapidly as in cotton linters, and apparently nearly as rapidly as in tow. Flame practically ceases when the surface fibres are burned away, and rapid burrowing incandescent combustion follows with considerable heat and moderate emission of pungent smoke.

In passing through pickers frictional electricity appears at times to be induced to such an extent that if the material is brought into close proximity to a conductor arcing and ignition follow. A number of fires have occurred which can be explained only on this hypothesis. A safer method than passing the material through pickers would seem to be its separation in slow-moving openers followed by blowing apart. If conveyors, fan cases and compacting bins are all of metal, the mass of metal will probably be adequate to absorb and radiate any electricity generated, and in any case the friction applied to the material is less. It would seem advisable, however, to adequately ground all pickers and electrically to connect all disconnected parts. In mattress-making the safer method appears to be to blow the material directly into the cases. Hand-stuffing involves the presence of much loose material on floors and furnishes the conditions for rapid spread of any fire that may occur.

It is almost needless to say that the material should be handled and worked only under automatic sprinkler protection. The looseness and permeability of the piles and the non-absorptive character of the material should render fires in it unusually amenable to control and extinguishment by water thrown from sprinklers.

It is difficult to compare different substances, and kapok has both good and bad qualities.

It is apparently not readily subject to spontaneous ignition. Laboratory experiments so indicate and the experience of large importers extending over fifteen years supplies no instance of spontaneous ignition on shipboard or in storage. It is not absorptive and does not increase in bulk like the woody fibres (excelsior, jute, plantain), nor gain so enormously in weight when wet as do these and cotton and wool waste. The general permeability of the mass is an advantage in fighting any fire that may occur in kapok, as water should reach the seat of combustion with little intermediate loss of bulk.

On the other hand, there is extreme inflammability and apparently electrical hazard. So long as the stock is in bales or handled under cover it would seem to present less hazard (except for possible semi-explosibility of air-blown stock while in pipes) than some of the other highly combustible fibres, but where loose stock is exposed the hazard is seemingly greater. In other words, the proximate hazard (of accidental ignition) is on the whole slightly less than that of several other fibres mentioned, and the ultimate hazard (capacity of supporting fire) about the same, but involving less possibility of collapsing floors due to increased weight than is the case with some materials. The principal danger arises from the ease with which superficial ignition is produced in loose stock.

From a fire prevention point of view three general precautions should be observed in use, viz.: reduction to a minimum of the volume of open or loose stock in the workroom, frequent sweeping to prevent accumulations, and prohibition of breaking or opening the bales in the same room with baled stock, the object of this last being to keep the quantity of kapok subject to ignition by fire in loose stock as small as possible.—*National Fire Protection Association Quarterly.*

Reducing Accident Hazard in Textile Mills.*

BY KENNETH MOLLER.†

It is obvious that the best insurance against accidents in a cotton mill or any other manufacturing establishment, for that matter, is to properly educate the help so that they will use ordinary precaution in pursuing their duties. It is also obvious that human nature is too frail to rely on this feature solely for the prevention of accidents and that mill owners and others in authority must do all possible to make things so that accidents will be eliminated or reduced to a minimum even if people are careless and forget the danger which always exists in any mill or factory.

There are two elements to be considered besides the constant campaign of education which must be carried on unceasingly. The first is to see that all machinery is properly guarded to eliminate as far as possible places where accidents can occur; and the second is to see that machinery is laid out and the mill kept in such a condition that accidents from these causes cannot occur. It is my intention here to call your attention to a few features in the layout and proper upkeep of a cotton mill which will help you to reduce the accidents and safeguard the workers.

Accidents in a cotton mill due to faulty layout of machinery are usually caused by crowded conditions, poor lighting, poor routing of work, and poor arrangement of drives. These are caused in an old mill through necessity or through a sense of false economy. In a new mill, there is no reason for these conditions except the question of false economy. There is always an instinct to get the maximum production from every square foot of floor space, and there is a very strong idea that the only way to get maximum production is to put a machine on every square foot. This is absolutely not true. In your crowded spinning room, you could probably get pounds more product, besides eliminating the accidents which are bound to occur in a crowded room, if you took out some of your machinery and rearranged the rest. Be sure to leave ample alley room and spare floor. You must have space to handle product in process of manufacture as much as space for the manufacturing itself. This space is just as much an adjunct of manufacturing as the space occupied by machinery and do not skimp it. Have perfectly definite space where full and empty trucks must be kept and insist upon them being kept there. A good plan is to have stalls marked out on the floor and insist that trucks be not left in the alleys. A better way yet is to use conveyors wherever possible even if does not reduce the number of men necessary for handling the product. They do get the work away from a machine as soon as it is finished and deliver it to the next machine. They keep the work in perfectly definite channels and out of the alleys. You will find that this system has a big effect on reducing accidents.

While all working alleys must be kept wide, all other spaces where people are not supposed to go should be so

*Delivered before the Textile Section of the Eighth Annual Safety Congress of the National Safety Council at Cleveland, Ohio.
†Lockwood, Greene & Co., Boston and Atlanta.

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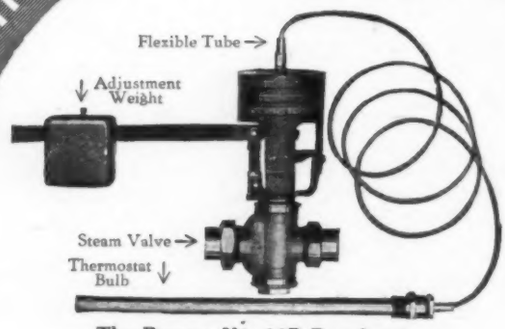

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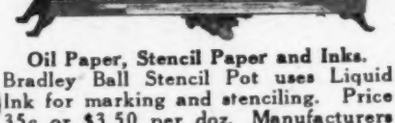

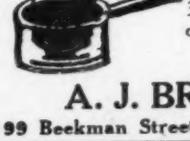

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small that it is impossible for anyone to go there. There is always an instinct to take short cuts. Do not have any short cuts. Make it so people have to use the main alleys and make those safe.

Next to congested rooms, probably one of the greatest causes of accidents is poor lighting. There are a few simple rules which will have a big effect in reducing accidents from this cause. First, try to have working alleys run across the mill so that light from the windows will shine down the alley and there will be a window at each end. Second, spend money in keeping the mill painted. You get accidents in old dingy mills and you get poor production. A coat of paint at least once in two years will always pay for itself in increased production and saving in artificial light. Where possible, use general lighting and where this will not work out, use individual lights in the alleys, but too high for the help to touch. Keep the windows clean. It is a very cheap way to get light and always means increased production and decreased accidents.

Keep the mill clean. Dirty floors strewn with bobbins cause accidents. Scrub floors but be careful when scrubbing that people do not slip. This is hard to do and must be handled through your education campaign.

Have seats for your help. Accidents are caused very largely by fatigue. Tired people are careless people. Have rest rooms for them and let them use them.

Have adequate locker rooms where all clothes must be kept and do not permit dressing around machinery which the help will do if you do not provide facilities for them to do so elsewhere.

If you have done all of the above things, do one thing more. Have a thorough and complete inspection of the mill once a week to make sure that all these facilities are being used; to be sure that everything is in repair; that there are not loose and broken planks in the floor and that the proper order and cleanliness prevails. Absolutely the only way to do it is to keep everlastingly at it.

One thing more you must have—the proper atmospheric conditions and ventilation for the help to work in. I believe that this has a big effect on the accident rate in keeping the help in proper physical trim and we all know that it helps production.

It is hardly necessary at this day to say anything of hospitals and first aid rooms. These are taken for granted.

In order to analyze the layout of a cotton mill to minimize accidents, let us start at the beginning of the cotton manufacturing process and go through the various rooms studying the layout of each room with the idea that when we get through, we will have done everything possible which will have any effect in reducing the number of accidents. I believe that you will note as an interesting fact that every single thing you do will be one of the cardinal things which increase production, for it is true that almost all accident reduction work is production increasing work.

The cotton arrives in cars at the storehouse siding where there should be a wide covered shipping platform. For best arrangement, the storehouse should be of concrete with concrete floors and no wood top floors. The cotton will probably be carried on hand trucks although in a great many cases it works out best to handle it on electric trucks which can be run right on to the elevators and when the bales arrive at the proper location, they should be stored on the floor one high. The proper stud for a cotton storehouse is eight feet and it should be built of flat slab construction without beams. Never pile cotton. Many accidents and costly handling will always result. The opener room should be on the ground floor of the storehouse. Cotton ready to be opened is put on each side of the opener apron; the bands cut with snippers and the cotton thrown on the opener apron. Never cut the bands with an ax. The delivery from the openers is automatic either to bins or to the pickers direct. The drive for all openers is usually by one motor driving a group. In this paper we are talking about ideal conditions only and the best which can be had so we will start out at once by considering only electric drive and individual motors wherever practical as I do not believe there is anyone who will dispute the fact that this form of drive is at once the safest and gives greatest production and is the one which should always be used where these two considerations will outweigh the added cost.

The cotton is blown to the picker room and by far the safest and most economical way to handle it is by some form of automatic distributor which places it directly in the hopper of the picker. In many cases there is no reason why the cotton should be touched at all in this process. Each picker should be driven by an individual motor directly mounted on the machine and the machines should be arranged so that it is impossible to walk between them or so that the clearance is so great that there is no danger from moving parts. If there is a passage between the machines, it should be at least five feet wide. Adequate space should be left in front of all machines so that the laps from one machine will not block up the passage ways before they are put on the next machine. The best system is to have racks between the breaker pickers and finisher pickers where the breaker laps may be stored.

After a lap is taken off a finisher picker, it should be put on a truck or a conveyor at once. A lot of accidents are caused by stock in process and full or empty trucks blocking spare floor, operating floor or the space between machines. Incidentally, if the work is kept in motion and there is a steady flow between machines, the inventory is kept down to the lowest point. The proper place for the product of each process is in front of the next process where it is to be used and not in the room where it has been manufactured. It is no good there.

The card room should be laid out, if possible, with all working alleys running across the mill so that we will get the maximum light and the cards should be placed so close together that there is no chance of anybody trying to walk between them, leaving just sufficient clearance for the working parts. Every eight cards, there should be an alley at least four feet wide which will be an obvious and safe passageway. There is practically no hazard in the back or front alleys. The working alley should be four feet between coilers and the back alley five feet wide to allow full lap trucks to be handled without injuring the laps. Around the drawing frames, there must be sufficient space to take the cans of card sliver and the full cans of drawn sliver. It is very important that adequate space be left around this machinery as it is too common a fault in cotton mills that the congestion due to a desire to crowd in machinery causes alleys to be blocked by material in process. Leave at least six feet clear behind the breaker drawing, six feet between the breaker and finisher drawing, and six feet in front of the finishers. This should give adequate space to prevent congestion. The same is true of slubbers. There must be sufficient space allowed to take care of the material in pro-

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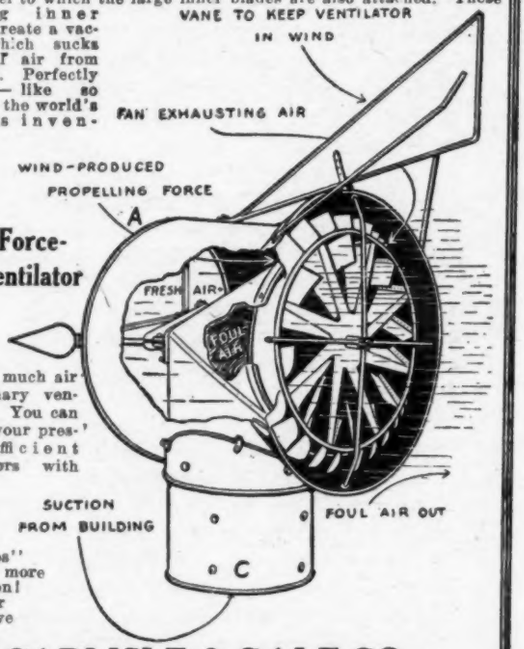

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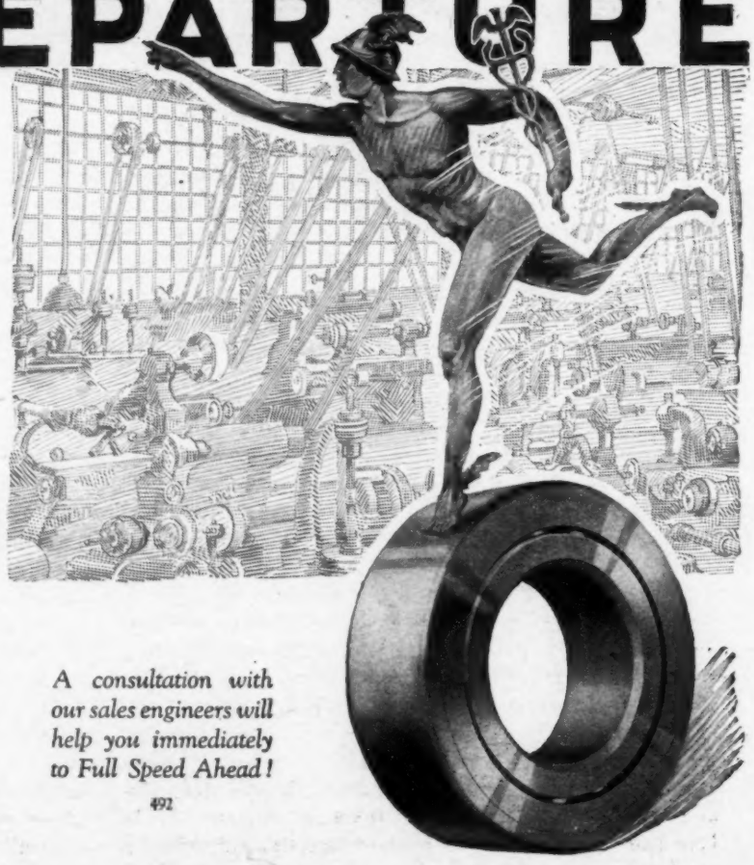

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cess. Leave four feet between slubbers in the working alleys and six feet of spare floor behind the machines.

As the card room will probably be driven by group drive, care must be taken to see that the shafting is properly located so as not to bring the belts low in a working alley. If necessary, run two lines of shafting rather than have one line run in two directions and so bring belts at a low angle in a working alley or where people work. Have perfectly definite spare floor for slubber roving next to the speeders and have full slubber trucks delivered to this floor as soon as they are doffed.

Cut out trucking where you can. In the layout for the Jackson Mill of the Nashua Mfg. Co., there is a spiral chute in the center of the room near the speeders. As soon as a frame is doffed, the boxes are carried immediately to this chute and sent on their way to the spinning room. There is no reason why there should ever be boxes of roving cluttering up the floor of the card room. The room should be clean all the time. Roving frame drives are usually so well guarded that there is little danger from that cause and it is usually an advantage to have an alley at each end of the frames. The full roving boxes when they leave the spiral chute run on a gravity conveyor along the wall in the spinning room. A conveyor under this shelf of gravity carries the empties back to the card room.

There are apt to be a good many accidents in spinning rooms. Put the drive end of the frames together and make it possible to walk between them. Have large alleys on the other end or between every two frames, at least five feet wide. Use individual motor drives if possible, otherwise four frame drives. The frames should run across the mill so that the light will shine down the alley and provision should be made to take the full bobbins away from the machines at once so that the floors will not be congested. The proper place for full spinning bobbins is either in the weave room or the spooling room. It might be interesting to note that in the Jackson Mill referred to there are chutes in the floor located at convenient places and as soon as a frame is doffed the yarn is on its way to the next department. These chutes lead directly to the weaving for the filling and directly to the spooling for the warp. Return conveyors carry the empty boxes back to the spinning room.

The looms should have individual motor drive if possible and be arranged with the alleys running across the mill if possible if the weaving is carried on in the lower stories of a mill. Of course if the weave room has a saw tooth roof, this is not essential. Have perfectly definite lines of travel; alleys which are obviously a means to walk in and have all other spaces too small to get through. Front or working alleys should be about 24 inches wide so as to make it easy for a weaver to run looms on both sides. Back alleys should be at least 2 feet 6 inches clear and cross alleys should be 3 feet. At convenient points, broad cross alleys and broad back alleys at least five feet wide should be located which are obviously the main arteries of travel.

There is no reason why the alleys should not be kept clear all the time except for trucks carrying filling from the conveyors to the looms and the beams from the slashers. A conveyor can carry the cloth from the weave room to the cloth room.

To sum up, the principal elements which go for safety in a cotton mill layout are: (1)—proper lighting both natural and artificial; (2)—proper alleys which are obviously to be used and which are as convenient as short cuts; (3)—proper spare floor for trucks and goods in process without crowding; (4)—proper heating and ventilating; (5)—proper dressing, toilet and rest facilities for help; (6)—proper upkeep and use of all of these after they are installed.

There seems no doubt that with due consideration given to these elements, we will get the maximum safety for the employees and maximum production for the owners.

Industrial Organization.*

BY CHARLES E. KNOEPPEL.

The conditions found after years of fighting to rebuild the world, for that is what is required, takes the whole thing out of the realm of cold reality and transfers it to the imagination. Because we will confront problems, the like of which we never solved before nor ever planned to solve, there is little to go by—no charts, no sextant, no compass, no gages of any kind.

Yet we must find a way out. The world seems to be completely lost, but it cannot stay lost or we perish from the earth. Leadership and statesmanship of the highest type are needed as never before in the world's history. My sincere feeling is that we will have both, for I have an abiding faith in the principle that every crisis makes its own leaders in the workings of an all-wise Providence of which we may know nothing, but of which we are cognizant.

In order to work out the semblance of a logical or orderly basis for reconstruction, let us establish a few fundamental principles:

a To fill depleted treasuries, trade at home and abroad is necessary, and the basis of trade is industry.

b For posterity to pay off debts in the form of taxation, industry must operate at a maximum, and the basis of industry is labor.

c To feed a hungry world the products of the farm are required, and to work the farms labor is necessary.

d To replace destroyed and run-down property requires the products of labor.

e To take care of the blind, crippled and helpless, is an industrial and therefore a labor problem.

f To demobilize and dismantle our war machine requires the greatest amount of consideration from an industrial and therefore a labor angle.

It therefore seems that the basis of the reconstruction will be industry, with the foundation of industry being labor. In this connection let me state a principle which labor as well as capital must realize in the future: If a military war cannot be won without quantity production, a commercial war certainly cannot.

This all spells a better getting together between the employers on the one side and the workers on the other.

It must not take long for industrial democracy to become a reality and it need not take long if we get down to fundamental principles and make every effort to secure the hearty co-operation of both sides in the industrial struggles we have so far had.

What do I mean by Industrial Democracy? It can be called "that condition in industry wherein both the worker and the employer work in harmony, co-operating each with the other on all matters affecting the management of in-

*Extracts from a paper presented before The American Society of Mechanical Engineers.

dustry, to the end that the public may ultimately secure the gain from a mutual consideration of rights and privileges."

Labor wants its say in the conduct of affairs, both political and industrial. It should have its say. Capital wants the same say in affairs. It should also have it. The consent of the governed, representation in affairs, liberty and the pursuit of happiness, are basic principles in political democracy and they should and must be the foundation of the industrial democracy which must come sooner or later.

There is another aspect that warrants our serious attention. The nations of the world desire to become trading nations because it is only through trade that money can be made. The nation that can win the most trade becomes the most prosperous. The one that is most efficient wins the most trade. Industry is the basis of trade with labor the foundation of industry. Hence, if labor is efficient, industry prospers, trade flourishes and money pours into the nation's coffers. If, therefore, this nation is to hold its own with the other nations of the globe, its workers and its employers must not refuse to work out a relationship which will make for prosperity and industrial success.

That we may have industrial democracy, that we may secure our share of the world's business so that our people may be both contented under the right form of government and happy in proper industrial surroundings, we must work toward a new objective in industry, which can be expressed as follows: To the worker, adequate wages to purchase the necessities of life and some of the luxuries; to the management, a reward in keeping with ability and effort; to capital, the proper return on investment; to the worker, management and capital, contentment and freedom from worry, pride in work and a liking for associates; to the consumer or public, products of industry of the highest quality and lowest cost. This all constitutes a type of organization, the ideals of which are the worthiest that can be imagined.

Let me explain what I mean by organization. Everything that we do or say, everything that we use or make, is the product of the brain. In the last analysis the human being is the power behind everything. Organization, therefore, is the proper adjustment of the relationship between human beings, in an effort to accomplish certain definite ends in life. If this adjustment is faulty, then we have an inefficient organization, incapable of making a success of what it undertakes. But if it is correct, logical and established along sound lines, then success is bound to result. A few years ago, I looked upon organization work as a cold-blooded adjustment of departments. Today I consider it as something wonderfully well worth while, as the making over of human beings, as "man-building."

Whether or not organization as defined is to yield maximum results depends on the nature of the relationship between the individuals who, while doing certain things, must co-ordinate with other people. We must remember that there are two kinds of rewards: first, the tangible reward which affects the pocketbook; second, the intangible reward which influences the soul.

Then, again, we must remember that the place a man lives in is the shop or office where he works and the place where he eats and sleeps. A good shop or office and a poor home do not go together any better than a fine home and a poor shop or office. There can be no proper relationships between individuals until in both the home and the shop or office there are factors which make for self-development in individuals.

It therefore seems that before any discussion on organization as it affects executives and workers is undertaken, it is necessary to give better consideration than has been done in the past to what industrial relationship really means. This can be done by stating three self-evident facts:

a Industry is nothing but the acts of various individuals engaged.

b Management consists of controlling and guiding these acts of the various individuals engaged in industry.

c Industrial relations are the reactions created in all individuals as a result of this control or guidance on the part of the management.

Having established these facts, the matter of the flow of influence in relationship is of vital importance and can be stated:

a Administrative Executives.
b Operating Heads.
c Superintendents and Foremen.
d Workers.

There are a variety of ways through which we influence industrial relations, as, for instance, personal contact and conversation, bulletins, verbal and written instructions, things seen, criticism or praise, physical and mental influence and material or monetary reward.

I have repeatedly outlined the following as my ideas of the things necessary to consider in proper relationship from the standpoint of the workers:

a The mental side of our workers must receive more attention than it has been given in the past.

b We must eliminate strenuousness in work.

c Force and drive must give way to leadership which inspires men to accomplish things.

d The faith of man in men must be a greater part of our industrial life than it is today.

e There must be a separation of the inefficiency of men and management.

f More consideration must be given to the problem of increasing exertion.

g Worry on the part of our workers must be eliminated.

h There must be a more equitable distribution of responsibility.

i The question of habit must receive proper consideration.

j There must be a more intelligent selection of employees.

k There must be fewer strikes and less industrial warfare.

l Labor and capital must view things more from each other's standpoint.

m There must be more attention given to industrial and vocational education.

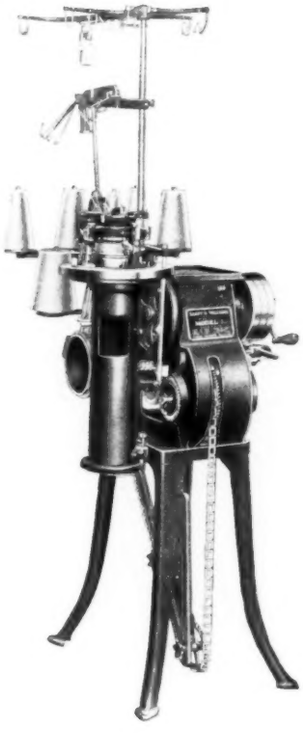
n Rest and fatigue must receive greater consideration.

o Work that stimulates must take the place of enervating work.

At this point let me state a principle which is the result of my years of contact with industrial problems: In industry, the difficulties at the bottom, in the way of faulty relationship, industrial clash and inefficiency, are nothing

(*Continued on page* 309)

KNITTING SECTION



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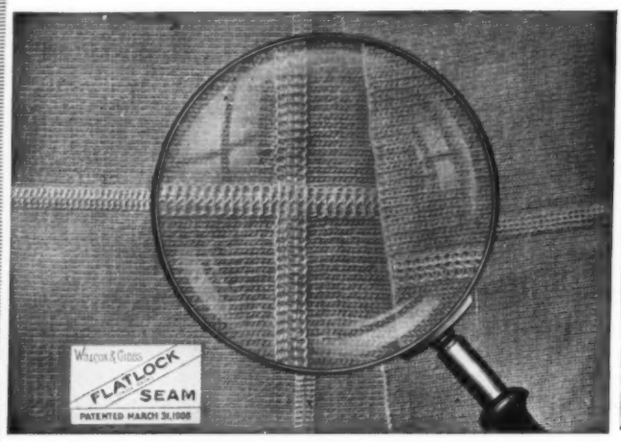

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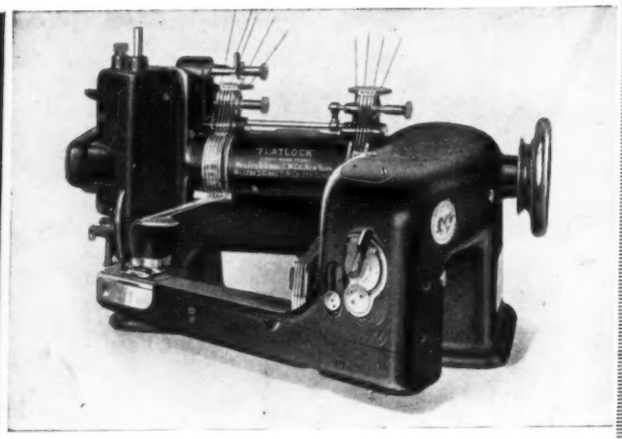

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Joint Meeting of Knitters at New York

Jobber and manufacturer are in accord in the view that, in knit goods, demand will continue strong, production inadequate and prices tend toward higher levels. This was brought out in the meeting of the Jobbers' Association of Knit Goods Buyers, on January 12, and the National Association of Hosiery and Underwear Manufacturers, on the 13th, both in New York.

When the call for the meeting of the manufacturers was issued, it is stated, it was felt there might arise occasion for offering facts calculated to rebut views advanced at the meeting of the jobbers. It developed that all that was said at the manufacturers' meeting in relation to the price outlook and prospective production and demand was but a confirmation of what was submitted when the jobbers met and emphasized the discouraging situation from the standpoint of relief from scarcity of merchandise and ultimately higher prices.

In a carefully prepared paper, A. T. Bradlee, William Whitman Company, made it clear at the manufacturers' meeting that mercerized and fine count yarns in the grey will continue scarce and high. In answering the question why manufacturers are buying these yarns at high prices he asked, "Why are others buying mercerized and fine cotton stockings at higher prices than are being paid for combed peeler singles?" He answered the question by stating, "Because there are not enough and the public is willing to pay the price for what it wants."

A. T. Walker, Walker & Serrill, specialists in raw silk, New York saw no relief from the high prices of silk until the new crop comes in, about six months hence, and with Japan controlling the situation and exporting much manufactured silk, he was by no means certain that even with a large crop, prices will decline.

G. Oberlaender, Berkshire Knitting Mills, Reading, Pa., in a recital of his experiences in Germany, disposed of the fear of competition from that country for a long time.

Wallace Wilson, Wallace Wilson Hosiery Co., Philadelphia, predicted no change in the market until after July, and it was his prediction that production will remain inadequate and prices high for one or two years. In defending the manufacturers against profiteering, he instanced ladies' stockings costing $11 a dozen at the mill selling in a retail store at $3.50 a pair, and infants' socks costing jobbers $3.50 a dozen retailing at one dollar a pair.

Mr. Wilson, while having little doubt as to a continuation of present conditions for the remainder of the year, counseled doing business as though intending to relinquish in six months, and then going along as the situation warranted. Joseph S. Rambo, Rambo & Regar, Norristown, Pa., expressed similar views.

Garnett Andrews, Richmond Hosiery Mills, Rossville, Ga., had entered the meeting, he said, imbued with the idea that lower prices of yarn might be looked for. This notion was dissipated, he continued, by the very clear exposition of the situation as to labor, production and demand by Mr. Bradlee. But he thought it would be a safe proposition to wait for developments as to the next cotton crop and the European demand for foodstuffs, of which there will be more definite knowledge in July and August. When it comes to pricing mercerized hosiery on present yarn cost, he thought, it will be necessary to make the rise on misses' ribs 50 cents, instead of 25, on size 7. Large sizes, at present prices and rise and fall schedule, show a loss for manufacturers. He pointed out that thus far manufacturers have been giving to customers the benefit of yarns purchased at comparatively low prices several months ago. Mr. Andrews counselled restricting sales to 90 days.

J. P. Voorhees, selling the production of a number of hosiery mills, took a market prospective from the viewpoints of both the speculator and the conservative operator. "It is my judgment," he said, "that curtailment in consumption will not be felt, that production will not increase or exports decrease, but my bump of caution impels me to advise hugging the shore. If I were a gambler I would buy everything in knit goods that I could pay for."

Joseph Felden, Roxford Knitting Co., underwear, selling the retail trade, said his company but a few days before opened its lines for Fall and that the first day's selling was the biggest first day's business of the company in many years. Retailers are buying heavily for Fall, he said.

George F. Dickson, Minneapolis (Minn.) Knitting Works, infants' and children's underwear, struck a responsive chord when he said, "Instead of questioning the justification for spinners' prices I believe we ought to devote more thought to the question, 'Where are we going to get off?' It has been our experience," he said, "that the higher the prices we have been compelled to name the more freely our goods have been bought."

One speaker suggested that knit goods be priced on the basis of present yarn costs and that low priced yarns be held in reserve for the period of possible uncertainty of which several manufacturers had hinted.

John M. Given, of The John M. Given Company, who besides heading one of the more important hosiery selling agencies is interested as a cotton grower, warned the meeting that while there might be an increased cotton acreage this year, it might be unsafe to bank on a large crop, for, he pointed out, the boll weevil has been traveling fast and far, and he is inclined to the belief that another short crop was in prospect.

D. L. Galbraith, American Textiles, Inc., Bay City Mich., presiding at the meeting, injected the slogan, "He who sells least profits most," and "He who buys first profits most," conveying the thought that while prices are destined to go higher, it should be the policy of manufacturers to sell for short periods. He warned manufacturers against opening accounts with a speculative class of dealers that pop up over night and establish themselves as jobbers. "It is not fair to legitimate jobbers or safe for ourselves to encourage the scalpers," he said.

Frank T. McElroy, Boiling Springs, Pa., thought that if it were true that spinners were getting prices as unjustifiably high as are complained of, manufacturers who have shown a weakness in putting prices where they ought to be, follow the course of the spinners, to some extent, at least.

The Jobbers' Meeting.

In opening the meeting of the Jobbers' Association of Knit Goods Buyers, Sim Beam, Smith-McCord-Townsend Dry Goods Co., Kansas City, Mo., the retiring president, warned his hearers that lower prices and a surplus of merchandise are not in sight and should not be expected for at

least twelve months. The year looms with most alluring promises, he said. "The danger," he continued, "lies in Washington. We have men there so ambitious politically that they will try to create an issue, regardless of the cost to industry."

All the speakers foresaw a great volume of business, but in their addresses there ran a vein of caution. John H. Schofield, Sullivan & Co., Philadelphia, urged deliveries to retailers for spring during the first quarter of the year.

J. P. Quinlan, selling agent for a number of hosiery mills, New York, expressed alarm over high prices and prospective rises, which he attributed to the stand taken by labor agitators and the operations of the excess profits tax, for which, he held, as did other speakers at the week's trades meetings, a direct tax on sales ought to be substituted.

Among the speakers to sound a note of warning was Lincoln Cromwell, William Iselin & Co., New York. He said: "We have a feeling that the speed boat is going too fast but that it will be worse to jump off than to stay on."

He paid his respects to the slackers by directing attention to the fact that "curiously, unrest is chiefly among those who were safe here during the war, receiving the highest pay and the best of everything, while those who risked their lives in the service at $30 per month have come home to be the staunchest defenders of the old law and order which made America great."

On the subject of high prices, and outlining one cause, Mr. Cromwell said: "Speakers everywhere insist that increased production is the only cure for the present troubles, but so far, these appeals for more work have only encouraged labor to larger demands and greater indifference. Unregulated labor and regulated capital make only for higher prices. But, for all the turmoil, business booms as never before. Retailers and wholesalers have no surplus stocks, and the ease with which they dispose of new purchases shows that the consumer is still ready to buy and has the money to pay. The multitude of new customers for fine goods makes the former spendings of the rich look insignificant."

The underwear situation was gone into in a carefully prepared paper by Frank H. Burgher, Bliss, Fabyan & Co., New York, who is regarded an authority on underwear. The production of knitted shirts and drawers in 1918, he said, was only about 22 per cent greater than in 1909, while in the same period the output of union suits increased from 2,473,103 dozens to 8,864,424 dozens. But, Mr. Burgher pointed out, we have been exporting seven per cent of our production, and 1919 showed a decrease of 12½ per cent in output, due to a shortening of the work day.

Taking the knitted and woven underwear as a whole, it appeared from Mr. Burgher's figures, based largely on census reports and mills' returns to the War Industries Board, that the underwear output of 1920 will be about two-thirds of normal consumption, this deficit, doubtless, being greater than the most rigid curtailment that might be practiced.

J. P. Voorhees, representing several southern mills, spoke extemporaneously on the hosiery price outlook. "You jobbers think prices are high," said Mr. Voorhees, "let me tell you that you have not yet seen high prices. We have just had a quotation of $5.65 a pound for 80s 2-ply mercerized yarn, on which I figure a difference of about $3 between total cost and selling price. And don't forget," he added, "that two spinning mills alone have diverted their output from knitting yarns to other purposes, taking out of supply about 8,000 pounds a year. I do not think you will see late this year 25 cent stockings, not even in seconds."

J. B. Lesher, Unrivaled Hosiery Mill, Williamstown, Pa., to whom had been assigned the topic "Production," offered no encouragement for its increase. His mill in 1917 increased its equipment 70 per cent, yet in 1918 and 1919 the output had not been increased 10 per cent. New mills are starting, it was pointed out, but must draw their help mainly from the old. Multiplication of plants, in the circumstances, it was held, increases overhead more, relatively, than production.

The jobbers discussed at length a proposed investment of $35,000 in an advertising campaign intended to educate retailers to buy of jobbers in preference to manufacturers, it being contended by the proponents that jobbers are able to distribute merchandise among retailers more advantageously than mills.

A recommendation that the plan be put into effect was approved, subsequently, by the National Wholesale Dry Goods Association, of which the Jobbers' Association of Knit Goods Buyers is a subsidiary body.

Many manufacturers, including some who sell to jobbers exclusively, doubt the expediency of launching such a campaign as is proposed. It is pointed out that early last year, even while retailers were clamoring for merchandise, jobbers remained out of the market, and it is on record that one member of the Jobbers' Association encouraged them to wait for lower prices, and that he even counseled retailers to withhold their orders.

It is the view of some manufacturers that as they buy machinery and much yarn direct they ought to sell direct. Others, of course, are content with the comparatively few accounts of jobbers and would hesitate to consider opening accounts with several thousand retailers.

Jobbers admitted in the meeting that at one time it looked as though they might suffer seriously from the increasing number of manufacturers selling direct to retailers. The Chalmers Knitting Co., Amsterdam, N. Y., several years ago startled the trade with its change in selling policy, and a few months ago S. S. Miller, Reading, Pa., hosiery, joined the ranks of mill-to-retailer manufacturers.

Ernest C. Hall, Clawson, Wilson & Co., Buffalo, was elected president of the Jobbers' Association of Knit Goods Buyers for the current year.

Softening Knit Goods.

Breton Minerol "F" for the finishing of knit goods is claimed to have the properties of producing a soft and silky finish that is resistant to the action of water and soap; thus, goods will retain even after laundering the greater portion of their original finish. For goods intended for napping, a treatment with this product will, it is said, produce a softer finish and assist in the napping operation. It may be used in the dyeing to replace the alkaline assistants, producing level dyeings and at the same time giving a silky "feel." Breton Minerol "F" is used for after-treating hosiery to give a soft finish and to remove bronzing produced by overdyeing. Sulphur blacks are so treated for intensifying and brightening.

Designs for the Knitted Coat Trade

BY WILLIAM DAVIS, M. A.

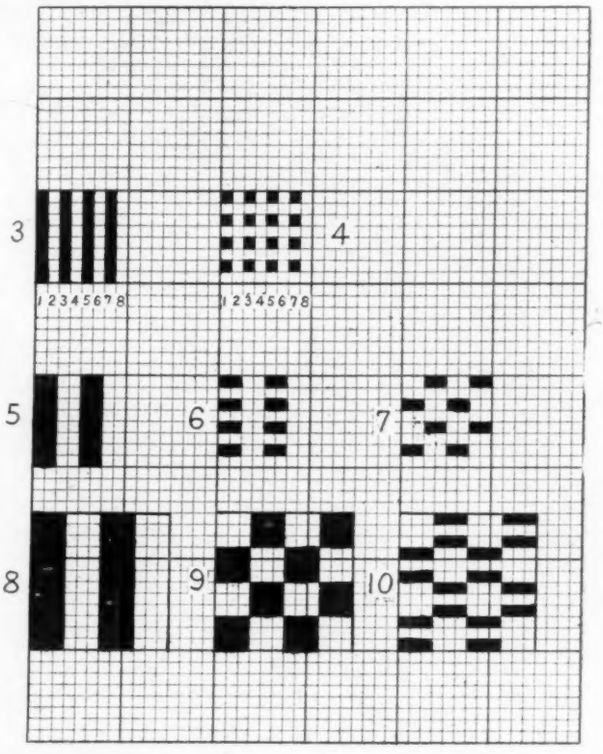
Whilst the pearl stitch garment of the moment is worked largely in the plain one and one garter pattern, the discerning manufacturer should now be on the alert to devise new patterns and styles which are likely to take well in the new season's fashion circles. Already the pendulum has swung from the coarse stitch to the finer stitch article and in the latter, stitches fancy in character have made their appearance in a modified degree at rib tops, the edges of pockets, etc. There may be a further development of the fancy patterns in the pearl stitch, and although it may take some time before the extravagant patterns of some years ago are approached, signs are not wanting that the pearl stripe and basket effects may have a successful run if excessive loudness and boldness are avoided.

In this connection it may be of interest to outline several of the basic principles of designing these stitches and describe the method of representing these on squared paper. An outstanding feature of such designs is their extreme effectiveness and if a back fabric stitch occurs on the face it stands out in bold relief to the surrounding plain-surfaced texture, and judiciously employed gives rise to effects distinctly ornamental in character.

A convenient means of representing designs on point paper is to use the ordinary kind of squared design sheet as employed for the weaving trade, the accompanying designs should be worked on the ordinary 8 by 8 ruling. All knitted designs should be worked out in 8 by 12 paper if large effects are desired as this will give a true representation of the effect as it should appear in the cloth. The explanation of this is that the courses per inch in a knitted fabric of normal build is about 50 per cent more than the corresponding stitches per inch in the width but for small effects it is not necessary to insist on 8 by 12 paper as it is immaterial except where proportions have to be preserved.

On the pearl machine whether of the flat or circular type, an outstanding advantage is that we can work ordinary rib effects and pearl stitch patterns on one and the same machine and this capacity is found of considerable service in giving greater scope to the ornamental features of a pearl stitch fabric. An examination of the accompanying designs 3 to 10 will make clear the difference between the rib and the pearl stitches, figures 3, 5 and 8 being ordinary rib stitches whilst the adjoining modifications give the pearl stitch patterns which can be obtained from the same setting of needles on the machine. Figure 3 represents a 1 and 1 rib stitch as worked on the pearl stitch machine, the black portions indicate back fabric stitches which in the case of the rib tend to sink into the fabric and form a kind of groove. To obtain this effect the needles of the machine are arranged in the front and back beds so that alternate needles knock over their stitches from the front bed whilst the other alternate set discharge their loops from the front bed; for rib work this arrangement of needles persists throughout the making of the piece.

In design 4 is shown a pearl stitch variation on the one and one rib arrangement which is largely employed as an interesting variation to the ordinary plain rib for the extremities of sleeves, body parts, and the tops of pockets. In this case the even numbered needles, 2, 4, 6, etc., work plain fabric whilst on the odd numbered needles, 1, 3, 5, etc. we have back fabric stitches occurring. The result is quite ornamental because of the distinct manner in which the reverse fabric loops stand out on the face of the cloth in contrast to the plain loops surrounding, this being the chief difference between the rib and pearl stitches. If reverse fabric stitches occur continuously in vertical fashion, as in the rib, these tend to withdraw themselves to the rear of the fabric and are almost inconspicuous on the face. Immediately the vertical order is broken, the reverse fabric stitches are thrown to the surface and are made all the more distinct by reason of the surrounding of plain loop fabric.



In the designs which follow, the principle of breaking up a rib pattern to form new combinations has been considered throughout and as result we have patterns which appear simple and elementary on design paper, but which, when transferred to the fabric, give extremely elegant and artistic results. Design 5 will be recognized as the plain 2 and 2 rib pattern and this can be worked on the pearl stitch machine by arranging the needles, two to discharge from the front bed alternately with two needles discharging from the back bed, this arrangement continuing without interruption. In the case of Design 6 this is obtained by the same two and two arrangement of needles but the back set is broken up into alternate three's by bringing the needles out of the back bed at alternate courses and making them discharge their loops along with the plain stitches in the front bed. This can be used as a modification on a rib top for a coat or it may well form the ground of a garment. Design 7 shows both rows of face fabric and

reverse fabric being alternated in the manner described and gives a pattern which proves very attractive for this class of trade. Design 8 is a representation of the 3 and 3 rib stitch which may be used to replace the 2 and 2 rib stitch when the sett of the fabric is finer than usual and more stitches are required to give an adequate result.

In design 9 is given a view of the well known basket pattern made on the basis of the 3 and 3 rib stitch, the face loops occur alternated with back loops in the manner shown and the result stands out very prominent in the fabric. In fact its prominence is too pronounced as the garment does not shape well with a pattern so bold as this, the reverse fabric stitches bulge on the surface in a manner which destroys its amenity to a large extent. To remedy this the basket pattern is often modified in the way

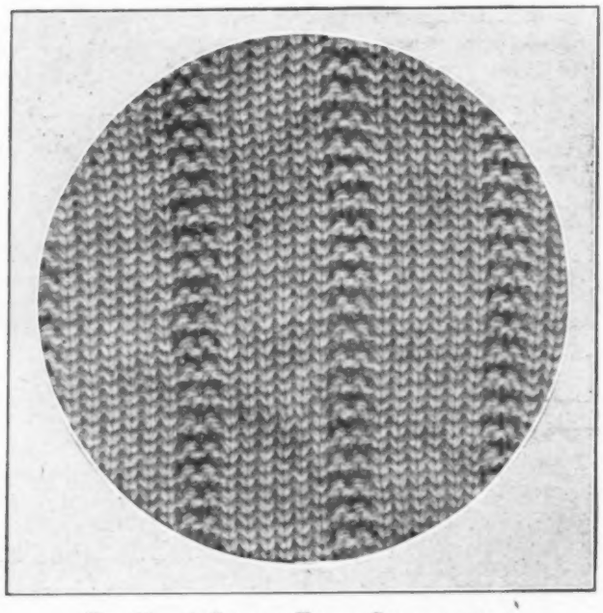


FIG. 11. A SIX AND THREE CONSTRUCTION.

illustrated in Design 10 where the center of the block of reverse loops is taken out and replaced by right side stitches. This has the effect of considerably stabilizing the fabric structure and making the surface more uniform and level whilst at the same time preserving the characteristic features of the patterns.

Figures 11 and 12 are given herewith as patterns of actual fabrics which are experiencing a keen demand this season for the coat trade and which are produced on the pearl stitch machine in the manner outlined. Design 11 has its pattern arranged 6 and 3, that is, six stitches are plain with three stitches arranged for alternate courses of plain and pearl stitch, these latter forming a ridge in the fabric which is very conspicuous. In the ridge itself the plainest factors are the reverse fabric stitches which occur crosswise, whilst the right fabric stitches are in a deeper cavity and give the part an effect of light and shade which gives a very chaste appearance to the garment.

Other variations include having the stripe wider than that shown in the figure, say about 2 inches or so whilst the rib stitch has also been used for the stripe. This does not produce such a level fabric but has an advantage in being more easily worked on the machine. The fabric illustrated in Design 12 gives the plain stitches as the leading feature of the design, the ground being 1 and 1 pearl stitch with a plain stripe as shown. This character of pattern is found very useful in giving a finished appearance to the extremities of knitted coats and usually the piece is only several inches in length and introduced as a kind of border. The design in Figure 12 is represented on squared paper in Figure 13 where the ground is shown in 1 and 1 pearl by alternate rows of black lines, the effect is obtained by the white parts shown which are worked in the plain stitch and form a striking contrast with the ground. The needles for the pattern are set 8 and 4, that is, four stitches are worked plain with eight stitches working 1 and 1 pearl for the ground. The length of the pattern in this example is 20 courses which when completed the needles are returned and are then transferred to the front bed at alternate courses to form the pearl stitch of the ground.

It is not sufficient for the maker of knitted goods to produce these patterns and designs on the machine but side by side he has to keep in mind the requirements of the garment when it is made up. In the majority of cases the knit goods manufacturer has also to produce the garments to fit the wearer in a manner commensurate with the prevailing fashion and style of the moment. In this connection he will have to consider whether he will cut the garments out of webbing or endeavor to fashion them to the shape of the individual who has to wear them. The pearl stitch lends itself by nature of its fabric structure to garments which hang loosely on the wearer and these garments have enjoyed a considerable popularity during

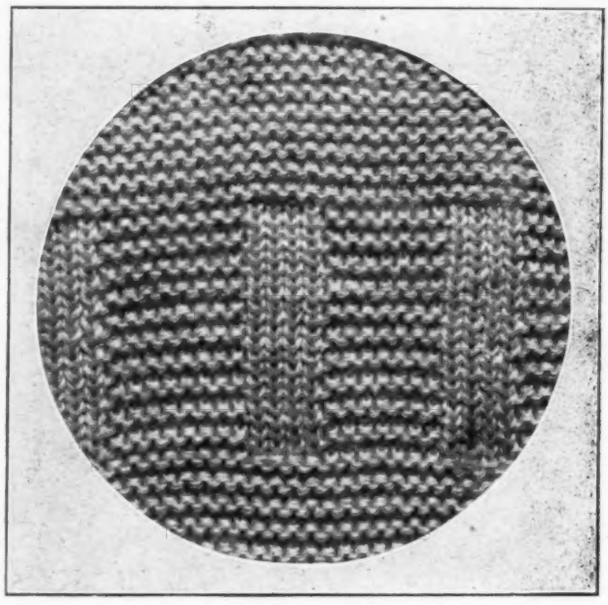


FIG. 12. A SUGGESTED BORDER EFFECT.

the present season. These garments are always more easily manufactured than the tighter and more severe varieties which have to follow exactly the contour of the human figure. Fashioning by hand on the pearl flat knitting machine is a long and laborious process and greatly increases the cost of manufacture.

If the articles are cut from the webbing, greater rigidity can be given to the garment by the use of a suitable form of binding two inches wide worked in a tight tension in the 1 and 1 or other suitable rib stitch. This binding performs a two-fold function, it gives a finished appearance to the garment and also keeps it from going out of

shape during wear, making the form more stable and reliable. If this binding can be produced in a color which harmonizes or contrasts suitably with the ground, it develops into a valuable color feature as well. The other function of the binding attached round the edge of the coat and neck is that it can be added at the cut part of the fabric and effectively conceal anything in the nature of a ragged edge so that in seaming the binding we are strengthening the garment structure and at the same time making an effective finish.

If the article is loose fitting then there will require to be added some form of sash or belt to gather together the extra fabric at the waist and cause it to hang in pleasing

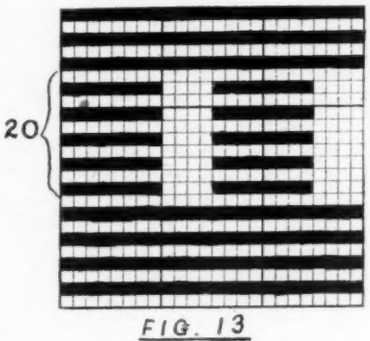


FIG. 13

folds. This belt can also be made a feature of the coloring. In the interests of correct shape it is an advantage to make these articles entirely without pockets as they form a continual temptation to the wearer to put her hands in them which bulges them out and drags down the garment at the sides. A free use of pockets in a knitted coat by placing articles in them will quickly ruin the appearance of the best made article and bring it entirely out of shape and form. If pockets are demanded by the fashion of the moment as is the case at present, then these should be made from flat pieces made separately in a firmer stitch and thicker texture than the ground so that it will be the better able to withstand the strain.

In the Foreign Field.

Spain is manufacturing hosiery, according to a person who recently returned from that country. Operations are in a small way, but the Spanish manufacturers are reported making headway and offering their product in France and Belgium. Spain's imports of hosiery during 1919 to November 30 totaled 2783 dozens of cotton and 4178 dozens of artificial silk.

Exports of domestic hosiery in November, 1919, the latest month for which official figures are available, amounted to 973,508 dozen pairs of cotton, valued at $2,752,098, and 94,706 dozen pairs of artificial silk, of a value of $611,409. The aggregate exports for the eleven months of 1919 to November 30 were 8,502,643 dozens of cotton, valued at $24,209,838, and 1,556,332 dozens of artificial silk, value $8,535,325.

Of the November exports, England took 188,121 dozens of cotton and 50,581 dozens of artificial silk, Denmark being the second heaviest taker—124,653 dozens of cotton and 4467 of artificial silk. Canada and Turkey in Europe took each in excess of 10,000 dozens of artificial silk and Argentina 6545. Among the larger importers of cotton hosiery, were Belgium, 17,461 dozens; France, 32,052; Greece, 21,799; Netherlands, 45,008; Norway, 37,113; Sweden, 83,961; Turkey in Europe, 46,043; Canada, 68,706; Mexico, 19,283; Cuba, 51,325; Argentina, 33,487; Chile, 14,488; Turkey in Asia, 17,214; Australia, 14,480; Egypt, 20,155. Countries taking approximately 10,000 dozens were Jamaica, Haiti and Peru.

Interesting accounts of conditions in Germany, one with respect to the production of artificial silk, and another dealing with the manufacture of flat knitting machinery and German-made latch needles, were brought to the second annual dinner of the Sweater and Knitted Textile Manufacturers' Association (Eastern District), at the Hotel McAlpin on January 20th.

S. A. Salvage, manager of the Viscose Company, whose company controls practically the entire artificial silk output of the country, told those assembled that he had recently returned from England and was informed that approximately a month ago Germany was producing artificial silk yarn at the rate of only 330,000 pounds per annum, as against the annual pre-war production of about 2,500,000 pounds, and the dislocation of things there caused by the war was so far-reaching that it would be a long time before normal conditions were restored. The significance of the 330,000-pound figure can best be illustrated, he added, when it is remembered that the Viscose Company is producing that quantity in about ten days.

In reviewing conditions in the artificial silk industry during the last year, Mr. Salvage remarked that it had enjoyed a great measure of success, in common with the rest of the textile trades, but drew attention to one unsatisfactory condition, from the point of view of the company he represents, in that it was unable to satisfy the demands of its customers and prospective customers.

The largest producing country abroad, he said, is England, and the production in the United States is double the British figure. He told of the progress that is being made in the expansion of the artificial silk industry here telling of the new plants completed and in course of construction by his company, adding that these plants have today an output of 200,000 pounds weekly, which, it is expected, will be nearly doubled by the end of the year.

A similar situation was said by Max Nydegger, of the Grosser Knitting Machinery Co., to exist with respect to flat knitting machines. He based his convictions upon his observations in Germany last fall, and told the diners that when he visited various factories in the Saxony district the wheels were turning and work resumed to such an extent that about 40 per cent of pre-war production could be looked for, if raw materials and coal for power and heat could be constantly available. One thing is sure, he emphasized, that more knitting machines have been sold for early delivery by German machine builders than can be turned out in two years under prevailing conditions, and that many an American purchaser will be greatly disappointed and find that the contract he holds will give him no redress in case of unreasonable delay in shipment, or unwarranted advances in prices above the contract figures. He remarked he was not present to spread gloom, but simply wanted to inform the trade of the actual conditions as he found them abroad.

"One pleasant bit of information I am able to bring you," Mr. Nydegger told the diners, "that is, that the needle shortage will be promptly relieved. Substantial quantities of German-made latch needles have already arrived.

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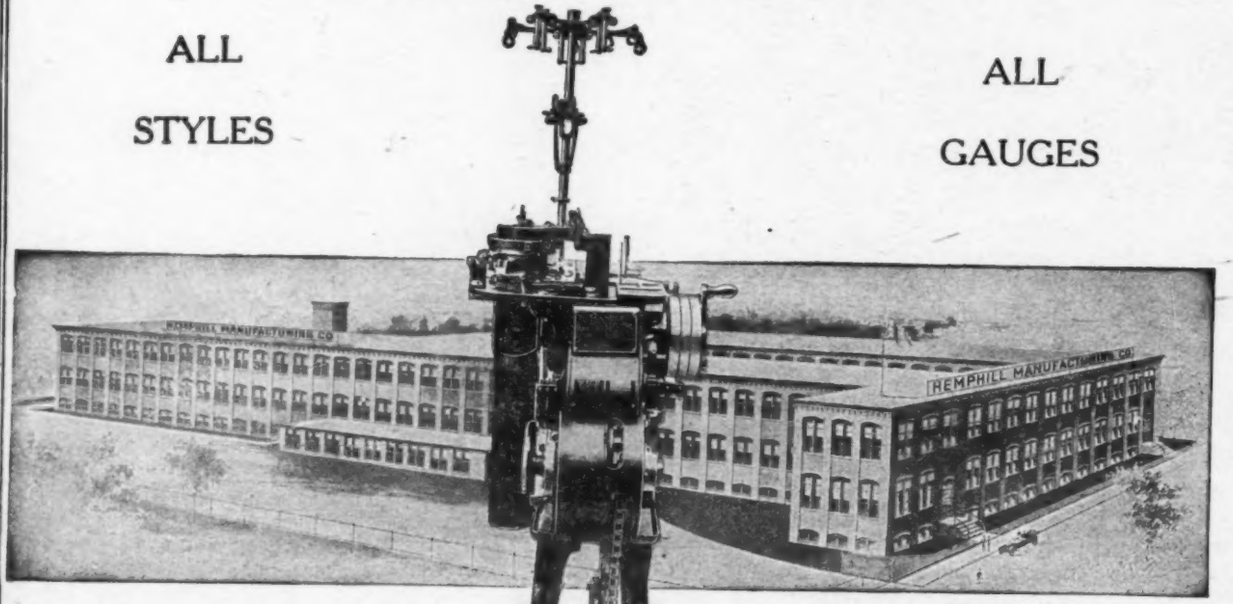

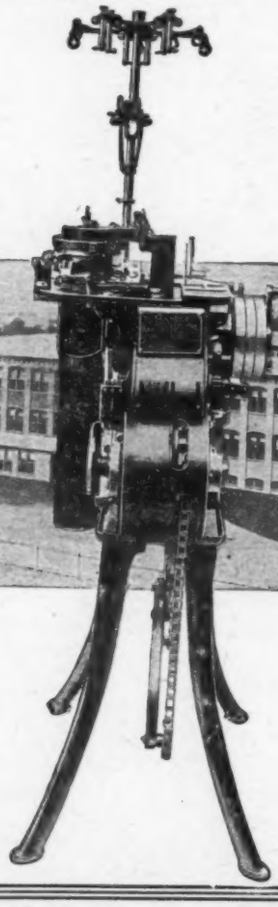

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The Knit Goods Market

Conditions in the knitting trade augur for continued strong demand, no worth while increases in production and an upward tendency in mill costs, with necessarily higher prices to the consumer.

The January spurt in the cloth market, with cotton strong in a finished product market that is not well supplied, gave an impetus to textiles generally. Jobbers bought heavily of underwear for next Fall and still are buying, and retailers are taking, from both mill and jobber, in full normal quantity. Prices of next Fall's merchandise there fore are known in the retail trade where they are proving no deterrent.

Buying power remains unchanged, leaving the inference that the curtailment which the pessimistically inclined predicted was certain, will not be witnessed for some time.

Thrift, economy and curtailment have been preached, to the farthermost corners until the words have become so commonplace as to leave not the slightest impression. What in some quarters is extravagance simply is good living among the masses. Curtailment may be seen, when the Nineteenth Amendment for the prohibition of the buying of the comforts of life shall have been ratified by two-thirds of the states.

It is practically a foregone conclusion that mills cannot in the next six months turn out all that was sold in the last three months, and while merchandise for Spring and early delivery for Fall is keeping mill help and machinery engaged, business will be piling up for a big go-off for the second half of the year, a period when prices logically should be higher than at present.

But that there will come a halt is as certain as the retreat of the tides after a strong flow. It will not be due for some time, with business left to itself. Imports will increase, but, gauged by the appeals from Europe for the financing of her industries, it would appear that it will be a long time before countries abroad can supply even their home demand, so that it would seem that exports should continue in great volume.

As to prices, it will not be overlooked that knit goods that must be bought late this year for Spring 1921 will be manufactured from yarns costing 90 cents, basis of 26s single carded, against 50 to 60 cents for the yarn that went into the merchandise being delivered now for the coming Spring and Summer.

But manufacturers are showing a degree of confidence that is likely to prove contagious. A sale of 10s 2-ply southern cones for deliveries running June to December was made at 85 cents. This yarn will go into goods for Spring 1921. A cloth weaver in mid-January bought 2-40s worsted yarn at the market price peak. This yarn too will be manufactured into goods to reach the consumer in the Spring and Summer of 1921.

This attitude among perhaps only a few manufacturers, and jobber and retailer buying normally, at prices higher than those during the war, is one of the indexes to a continued boom market for knit goods.

An increasing demand for good grades of women's cotton stockings is noted, attributed to the very high prices of silk and mercerized. A large department store buying from the mills direct is taking approximately five times the quantities purchased a year ago, and it is stated by the hosiery manager that this type of goods is a better seller at 39 cents a pair than when retailing at 12½ cents a pair. At least two stores paying mills $3.50 a dozen have priced the stockings 39 cents a pair, while a line of misses' costing retail dealers $3.25 a dozen is selling at 35 cents a pair. A mill specializing in the better grades of women's cotton hosiery received an order for 10,000 dozen pairs and was compelled to scale it to almost one-half that quantity.

Scant production, which some time ago was confined more particularly to higher priced hosiery, has become pronounced in all of the better grades of cotton lines. This is but a logical result of the sharp advances in silks and mercerized, lines in which wage advances are figuring to a greater extent than in cotton goods. A Pennsylvania hosiery mill announced a voluntary increase of 10 per cent, amounting to a jump of $180,000 a year in the payroll. Full fashioned knitters in Philadelphia have been granted increases amounting to 12 to 15 per cent. In one knitting center organized hosiery boarders, who have a contract which will not expire until August, have submitted a request for an increase for "meeting the higher cost of living."

A line of full fashioned silk hosiery for women, the product of a Pennsylvania mill, which probably will start selling soon for the Fall, will be priced $32.50, it is announced. The same stockings sold at $7.50, pre-war.

A line of women's mock fashioned silks, 12-thread silk boot, is selling at $21.50 a dozen, a new high record. Another high price scored recently was $7.20 a dozen for half hose of artificial silk plated on mercerized, a line that a few years ago sold at $1.77½. The demand on one mill alone is many thousands of dozens in excess of the output of the next few months.

The highest price heard for silks is $15 for 12-thread 240 needle half hose of a very high type. No sales have been made at this figure by the house offering the line. It is stated the sock is priced on the basis of silk costing $14.50 a pound and mercerized yarn, for the foot and top, $2.75. At this rate the sock, if it finds a market at the price mentioned, should go considerably higher. A 10-thread 220 needle silk sock has been sold at $10.50. Both lines referred to are of the seamless variety.

Will the ladies pay the new high prices, which will not become effective in retail stores for eight or ten months? There is a fear that they will not buy as freely as at present values, and this fear seems to have seized some of the larger retailers, for it is known that at least one department store selling at two dollars per pair is getting six dollars per dozen less than the mills' price for Fall, while in a number of large stores instructions have been given to feature silks by keeping prices at the lowest possible figure, using the line as a leader.

Women's mercerized stockings are headed toward a $1.50 retail proposition in very high grade lines. A shaped seamless stocking will go to jobbers at $8.50 to $9 for Fall. A sale of women's fine gauged mercerized, from 70s 2-ply yarn was made at $7.75. A Philadelphia man is holding 240 needle mercerized at $7.50. This line is made from 60s 2-ply, with 50s top and 50s and 60s foot. None has been sold at the mill's price, which, however, is being adhered to. The next price for 220 needle mock fashion may be expected to range from $7 to $7.50 a dozen.

The Improved Latch Needle Machine

Looks like an ordinary Latch Needle Machine, but has the methods of a Spring Needle Machine in a Modified Degree and the Fabric Produced is Excellent Quality.

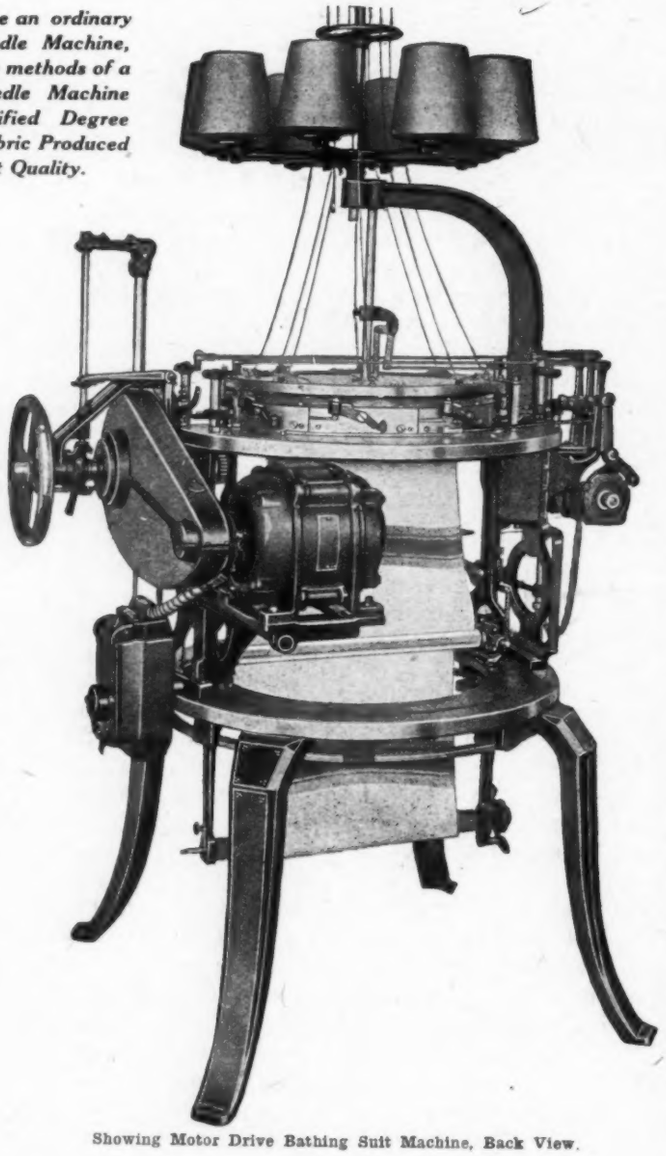
Fig. 1. Plain Fabric Machine.

THE objection to the ordinary form of latch needle is that each needle forming its stitch separately, on its own, so to speak, causes the loops to exhibit minor variations in size which precludes the use of this machine for goods of the best quality.

The Wildman Latch Needle Machine may look like an ordinary machine, but the fabric which it produces proves that it's the most perfect machine in its class.

Perfect control is exerted over the loop formation by the use of sinkers in addition to the latch needles. Uniformity of stitch and smooth fabric is assured.

The Wildman Motor Drive Knitting Machines are appealing to the manufacturers who demand utmost production and a more efficient and sightly plant. The Wildman Motor Drive increases production 10 to 15 per cent as there is no loss due to belt slippage—no belt to guard—unsightly belts and shafting done away with, giving more light and a better-looking plant—machines located more easily and their position changed quickly.



Showing Motor Drive Bathing Suit Machine, Back View.

Write today for the Wildman catalog.

WILDMAN MANUFACTURING CO., Norristown, Pa.

WILDMAN KNITTING MACHINERY

Misses' fine gauge mercerized, selling around $6.50, are regarded due for an advance to $6.75, and there are intimations of a revision of the rise and fall schedules, which would widen the margin between large and small sizes. The present rise is 25 cents. Thus a mill selling on the basis of size 7 is getting an increase of 25 cents on every size above 7, bringing size 7½ up to $6.75 and size 8 to $7. Size 8 consumes three ounces more of yarn than size 7, it is stated, and size 9 requires four ounces more than size 8. As the yarn costs manufacturers approximately 30 cents an ounce, it is apparent that on the basis of 25 cents per dozen rise the larger sizes yield relatively less than the smaller sizes, on which there is a fall of 12½ cents from the price of sevens. An advance from $6.50 to $6.75, followed by a higher rise, would, it is apparent, mark a startling increase in the cost of misses' mercerized ribbed stockings.

Mills with yarn in stock are quoting $5 a dozen for 220 needle half hose. A price of $5.50 also is heard. A mercerized sock of 4-strand silk plated on is quoted at $7.50, which is regarded low in the trade, considering the fact that silk is commanding $20 a pound and the mercerized yarn anywhere from $4 to $5. Prices of mercerized goods apparently have not reached the top, so far as relates to the latter months of 1920.

Two mills have quoted mercerized half hose at $6, which is from fifty cents to one dollar higher than like goods are quoted by a few jobbers who have small quantities bought early last year. It is not recorded that sales have been made at $6.

One New York establishment which is about to name prices for late Spring deliveries states that its 220 needle mercerized stocking for women will go to jobbers at $7, based on the cost of yarns bought some months ago. "We will not buy a pound of yarn before April, at the earliest," said the executive. "We will operate as though we expected to get out of business after working up the yarns in stock or in sight. If prices remain where they are we then will buy yarn on a hand-to-mouth basis. In the meantime we will look for no new trade, being content to give customers now on our books the benefit of the best prices we can offer."

Infants' mercerized fancy top socks, being delivered against old orders at $2.85 and under, are regarded fairly priced at $3.35, although, it is understood, some favored customers were able to buy recently at ten cents under. A manufacturer specializing in the line writes to a commission house that if he were in want of business his price for April to June would be $3.50.

Speaking of the desirability of increasing the rise per size on mercerized hosiery, the representative of one of the larger mills says he recently made a careful investigation as to the proportion of large and small sizes purchased by jobbers. Selecting orders indiscriminately for children's ribbed stockings aggregating 10,000 dozen pairs, it was found that 10 per cent were under size 7 and that, therefor, 90 per cent were for sizes 7 and above.

While prices of all lines of hosiery continue firm, with advances being recorded, the wide divergence in prices is causing manufacturers to hesitate about going out for business for the second quarter of the year.

The Rome (Ga.) Hosiery Mills opened on January 19, quoting about prevailing prices for men's and women's 176 needle cotton goods. John M. Berry, president of the company, was in New York, to remain about two weeks, during the selling for April to June.

Low end cotton hosiery is holding firmly at good prices. A line of women's 176 needle is variously quoted, depending on deliveries, with $1.80 to $1.85 a top price for 20-ounce, and $1.90 to $2 for 24-ounce. Some sewed toe 20-ounce is being quoted around $1.70 to $1.75, in contrast with 57½ cents pre-war.

Half hose of 176 needle full looped, 18-ounce, is quoted at $1.85 for April to June, with $1.90 being asked by some establishments, while a few are selling a high grade sock of 176 needles, single thread, at $2.

A 176 needle sock, 24 ounces, carded yarn, is selling in limited quantity at $2.35. Sales of a similar sock, weighing 19 ounces, were made at $2 for black and $2.05 for colors.

A branded 144 needle sock has been sold at $1.65. Several mills are sold up at $1.50 and naming $1.60 as next price.

Misses' ribs, 28 ounces on size 9, are bringing for a few manufacturers $2.50, although it is understood the prevailing price ranges from $2.25 to $2.40. A line was offered recently at $2, but it develops that the stocking is of light weight, not more than 26 ounces on 9s, while the leg resembles to some extent that of size 6 of regular makes. These are in a class with a line of 176 needle half hose offered at $1.50 and not finding ready buyers.

Seconds of 220 needle mercerized are being sold by one large mill at $3.75 for women's and $3.25 for half hose, net 30 days f. o. b. mill, no freight allowance.

Combed peeler half hose are selling at $3.65 to $4.25 for double sole, and around $3.25 for single sole. At $3.75, the sock passes beyond the 50-cent retailer.

Mill representatives are unable to account for the wide variation in combed peeler half hose prices. A very good line, double sole, from a Pennsylvania mill, is going to jobbers at $3.65. Another mill is getting ten cents better, and has sold one number at $4.25.

It is pointed out that at $3.75 the sock cannot be sold as a 50-cent retailer and would not move in competition with the sock costing jobbers $4.25. As the lower priced stocking is moved beyond the 50-cent class, it is reasoned that it were better to put the higher priced number in stock, and it was on this line of reasoning that a sale of the $4.25 line was made to a jobber who reckons with his customers, the retailers.

A light weight 220 combed peeler is to be had from a commission house at $3 net. The same establishment shows what purports to be a 220 needle combed sock priced at $2.30. It is said by persons who have examined the stocking that it is made from carded yarn gassed. A 200 needle carded sock from the same mill has been sold quite recently at $1.85, which is about the price of the 176 needle. The 220 combed is of even price with a 188 needle combed and therefore is regarded being sold under the market, the 188 having proved a seller at $3.30.

Some of the New York State mills may offer shortly additional underwear for Fall. During the brisk selling immediately following the formal opening a great many of the mills reserved a small per centum of their estimated production as a safeguard against lessened output due to labor trouble or other causes beyond their control. Be-

"Paramount Method" Grooved Forms

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PARAMOUNT GROOVED FORMS insure economical and correct boarding of Mock Seam and Full Fashioned Hosiery.

Three types of Grooved forms, each constructed to meet particular boarding requirements.

The "PARAMOUNT CENTER GROOVE" form with the groove in the center of the edge of the form is well-known and widely used. This form eliminates "rights" and "lefts," insures perfect alignment, and simplifies and facilitates work in the pairing or mating department.

The "PARAMOUNT SIDE GROOVE" form for manufacturers preferring the seam finished on one side. This particular form is favored by many users. The groove on the front edge makes it possible to quickly place the seam and assures the same perfect alignment of fabric as the Center Groove.

The "PARAMOUNT DOUBLE GROOVE" form is adaptable for the finishing of "Rights" and "Lefts." The double groove makes it possible to finish the stocking with the seam on either side *On The Same Form*, insuring minimum equipment for production required.

Patents dated Oct. 14, 1913, Mar. 6, 1917, and May 28, 1918, cover these features.

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Complete equipment can be seen in New York Office, 366 Broadway. Address all correspondence to Chicago Office.

PARAMOUNT HOSIERY FORM DRYING COMPANY

Hunter Bldg., Market and Madison Sts., CHICAGO, ILL.

sides, it was felt at the time that values were destined to go higher. In a number of the New York State mills output continues to suffer from labor troubles.

Mills which sell the retail trade find dealers taking in normal quantity, with inquiries pouring in as to when road salesmen will call. There is apparent a fear among retailers that unless their orders go through early in the Fall selling campaign, they may not be allotted their requirements. In a number of instances it became necessary for mill-to-retailer manufacturers to assure inquiring customers that their wants would be supplied in the usual quantities.

In contrast with this interest among retailers, some jobbers, notably in the Central West, are apathetic, particularly as to cotton goods. That the Central West has yet to buy much underwear for Fall is shown by the volume of business that is offered from that section to a southern manufacturer making heavy weight cotton goods exclusively. This mill withdrew its lines after selling 16-pound ribbed union suits at $19.50, and since has refused to quote. It is intimated that the next price will be $22, and a price of $24 is heard as likely.

While this mill is not naming prices, another establishment, whose price for the 16-pound suits is $20, is having very little call for the garments. This is considered somewhat amazing, in view of almost certain advances. It is stated that notwithstanding the $20 suit is not selling freely, the price will have to be moved up to at least $21, to conform to higher yarn costs.

Perhaps the strongest numbers in heavy weight underwear are boys' fleeces and ribs, in both of which there appears to be a scarcity.

While in some underwear lines opening prices have not been revised, in others there have been advances of 10 to 12½ per cent, and it seems a safe assumption that late buyers will have to pay additional increases.

There continues a good movement of spring underwear, duplicate orders and new business, at better prices than ruled at and immediately following the opening. Here again tardy buyers are paying the penalty for restricting operations in expectation of a lower market.

Among the Knitting Mills.

Plans have been completed for a $250,000 dormitory for young ladies employed at the Durham (N. C.) Hosiery Mills. This dormitory will be the largest single effort of the mills at welfare work. The plans and specifications are being handled by the Milburn-Heister Company of Washington, D. C.

This new building will afford dormitory accommodations for 200 girls. Every modern convenience has been included in the plans. The building will be four stories high and will have a glass-enclosed roof. Among the features which will be incorporated in this dormitory are a swimming pool, gymnasium, laundry and bakery shop. There will also be eight reception rooms and a dancing pavilion, in addition to an auditorium which will have a seating capacity of 500. Work on this building is expected to start in the early spring.

Completion of the plans for the erection of the Grey Hosiery Mills at Bristol, Va., has been made. There are to be two buildings; one will be a two-story brick structure, 56 x 100 feet, and the other will be a one-story brick, 50 x 80 feet. Both buildings are to be equipped with modern machinery sufficient to give the mills a daily capacity of 1,000 dozen pairs of hose.

The Louise Knitting Mills, East Durham, N. C., have increased their capital stock from $150,000 to $500,000.

The Gaffney (S. C.) Knitting Mill has been organized with a proposed capital stock of $25,000. The petitioners are W. K. Gunter, W. E. Peeler and C. M. Smith.

A branch of the Lillian Knitting Mill, Albemarle, N. C., is to be established at Badin, N. C., it is reported.

Plans for the erection of a factory for the manufacture of knit goods at Roanoke, Va., have been completed by the McBain Industrial Corporation, recently incorporated in that city. It is announced that contracts have been closed for the immediate erection of a two-story mill construction building, 103 x 177 feet. The machinery, all of which has been contracted for, is estimated to cost $100,000. The factory will be driven by electric power and will probably be ready for operation by early spring.

The Virginia Hosiery Mills have been incorporated at Norfolk, Va., with a maximum capital stock of $50,000, to manufacture and deal in woolen and worsted goods and other fabrics. Arthur Booth is president and Meyer Silverman, secretary. S. Carl Von Gottschalk is also one of the incorporators.

The Wilkes Hosiery Mill, North Wilkesboro, N. C., has been chartered with a capital stock of $100,000. The incorporators are J. G. Hanes, James N. Weeks and others.

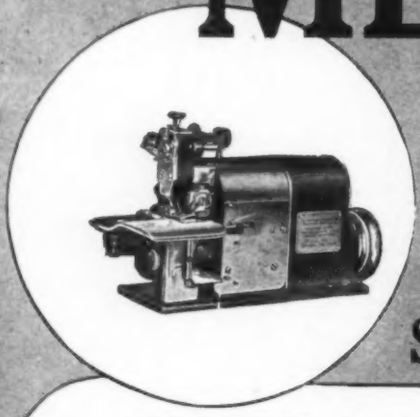
The Winner Hosiery Mill, Boiling Springs, N. C., has amended its charter to increase its capital stock to $100,000 and to change its name to the Winner Mills, Inc.

John Blood & Brother, Inc., manufacturers of ladies' cotton ribbed vests and union suits, Trenton and Allegheny Ave., Philadelphia, Pa., have sold the factory building and offer the machinery for sale, it having been determined, in view of unsatisfactory labor conditions, to relinquish the knitting business. Lately the company has been able to get only 30 to 40 per cent of capacity production and was compelled to reject considerable business that was offered to it. Orders on the books will be completed, it is understood, but no new business can be accepted. The business was established 30 years ago and had grown to large proportions. The senior member of the company is Edward Blood, Sr. The company will continue the business of processing yarns, in its mercerizing and bleeding plant adjacent to the knitting mill.

The Illinois Knitting Company, Mount Vernon, Ill., has been taken over by the American Textiles, Inc., of Bay City, Michigan, of which the mill will be known as Mount Vernon Plant No. 2. The production, largely, is children's ribbed hosiery and ladies' rib top stockings, silk and mercerized hosiery being among the mill's well known numbers. P. C. Withers, until his death last August, was president, treasurer and general manager of the Illinois Knitting Co. The production of the several plants of the American Textiles, Inc., is sold through its New York office, 1107 Broadway.

The Continental Mills, Inc., Lena and Armat Streets, Philadelphia, Pa., manufacturer of knitted fabrics, has commenced the erection of a new one-story power plant at its factory, to be used for general works operation. The structure is estimated to cost about $25,000.

MERROW



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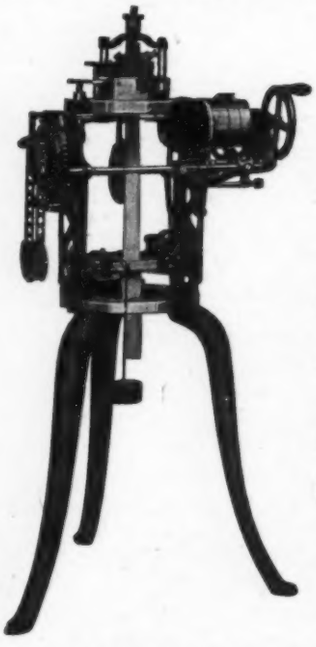

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The Bernstein Knitting Mills, Brooklyn, N. Y., have been incorporated with a capital of $150,000 to engage in the manufacture of knit goods. William S. Ramsey, C. S. Jullien, and C. B. Hockman are the incorporators.

The Primrose Sweater Mills Corporation, New York, has filed articles of incorporation with a capital of $50,000 to manufacture sweaters and other knit goods. I. Tanner, S. S. Posen and M. Posen, 1215 Madison Avenue, are the incorporators.

The Gabriel Hosiery Company, Coopersburg, Pa., specializing in the production of women's and children's hosiery, is arranging for the installation of machinery and equipment in a local building acquired some time ago, to be used as an addition to the present works. The proposed new plant will be used for increased capacity, and the company plans to inaugurate operations during the coming spring. R. A. Young is superintendent.

The Eskimo Knitting Mills, Philadelphia, Pa., manufacturers of sweater coats, etc., has purchased a three-story building to be used, it is understood, to provide for increased operations.

Charles H. Barger, of Bloomsburg, Pa., is understood to be arranging plans for the construction of a new one-story brick and mill type hosiery factory at Espy, Pa. The proposed structure will be about 40 x 75 feet, and is estimated to cost $10,000.

The Manhattan Hosiery Company, Paterson, N. J., has been incorporated with a capital of $250,000 to operate a plant for the manufacture of hosiery. Robert H. Naive, John Pomfret, Jr., and Robert L. Buckley, Paterson, are the incorporators.

Arrangements have been completed by the Keetch Mills, 2101 Superior Ave., Cleveland, Ohio, for the erection of a new two-story brick addition to its plant, about 60 x 147 feet, for increased operations. Contract for the structure, which is estimated to cost about $40,000, has been awarded to the William Dunbar Company, 8201 Cedar Avenue, Cleveland.

The Beverly (N. J.) Underwear Company, manufacturer of ribbed underwear, has awarded a contract to Hugh B. Miller, Edgewater Park, for the construction of a new branch plant at Burlington, N. J.

The Square Deal Knitting Mills, Inc., Reading, Pa., has filed articles of incorporation with a capital of $10,000 to manufacture knit goods.

The Allentown (Pa.) Knit Fabrics Company, operating works at 32 North Church Street and at Law and Chestnut Streets for the production of jersey cloth, has perfected a merger of its mills. It is proposed to concentrate the entire output of the plants in the factory at Law and Chestnut Streets. Rudolph Schreiber is president.

The Feelrite Hosiery & Knit Goods Company, Buffalo, N. Y., has filed articles of incorporation with a capital of $100,000 to manufacture hosiery and knit goods. Leo and M. K. Stein, and William Schuman, 723 West Delavan Avenue, New York, are the incorporators.

Plans are progressing favorably for the immediate establishment of a new silk hosiery mill at Lebanon, Pa., by Harry R. Heilman and Robert J. Behney. Machinery and equipment installation will be rushed to provide for the inauguration of operations at an early date.

The Ward Hosiery Company, Gloversville, N. Y., has been incorporated with a capital of $30,000 to manufacture hosiery. William J. Ward, Harry A. Steele, and William H. Skaine, Gloversville, are the incorporators.

Lehman Brothers, Green Street and Switz Avenue, Easton, Pa., manufacturers of underwear, are considering plans for the erection of a new one-story brick addition to their plant, for increased operations. The proposed structure will be about 48 x 110 feet, and is estimated to cost $10,000.

The James R. Kendrick Company, 125 Herman Street, Philadelphia, Pa., manufacturers of elastic hosiery, etc., has recently awarded a contract to R. M. Peterson & Son, 5114 Germantown Avenue, for the construction of a new four-story plant, about 60 x 125 feet. The new works are estimated to cost about $75,000.

The Blue Bird Knitting Mills, New York, have been incorporated with a capital stock of $15,000 to manufacture knit specialties. Edward and K. Metzer and David Wirtschafter are the incorporators.

The Federal Knitting Company, Inc., Diamond Street, Philadelphia, Pa., has awarded miscellaneous contracts in connection with the construction of its new two-story plant, about 69 x 157 feet, to be located at Cambria and Jenney Streets, to insure early completion of the works. The new plant is nearing completion and will represent an expenditure of about $100,000.

The Waynesboro Knitting Company, Waynesboro, Pa., has recently inaugurated operations in a new branch establishment at Smithsburg, Pa. The initial installation comprises about 35 knitting machines.

The Wallace Wilson Hosiery Company, Philadelphia, Pa., has recently completed negotiations for the leasing of the building formerly occupied by the New Haven Button Company, New Haven, Conn., for a period of five years, for the establishment of a branch plant to specialize in the production of infants' hosiery.

The Armada Knitting Mills, Hamburg, Pa., are making rapid progress on extensive alterations and improvements in their plant to facilitate operations. It is expected that the work will be completed at an early date.

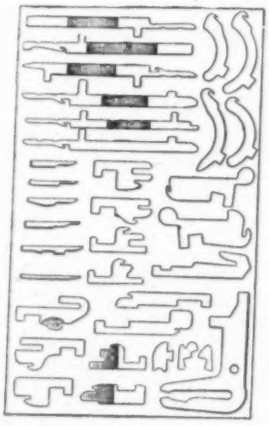
The Tauber-Lipton Company, Rutland, Vt., manufacturer of hosiery, is understood to be arranging for increased production at its plant. The company has provided for an increased power supply at its plant, service being furnished by the Rutland Railway, Light & Power Company.

The Ironwarp Knitting Mills, Allentown, Pa., are making rapid progress on the construction of the proposed new two-story reinforced-concrete addition to their plant, about 68 x 125 feet. It is planned to inaugurate operations about February 1.

The Navy Knitting Mills, 236 Fifth Avenue, New York, is understood to be arranging for the construction of a new plant. About 20 additional knitting machines will be installed for initial operations. The company recently filed notice with the Secretary of State of an increase in its capital from $50,000 to $200,000, to provide for a proposed expansion.

Incorporation of the Franklinton Hosiery Mills, Inc., Raleigh, N. C., by J. F., W. F., and J. R. Mitchener has been announced. The capital stock of the new company is $150,000.

The Durham (N. C.) Hosiery Mills have awarded a



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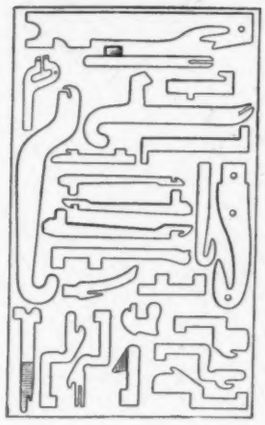

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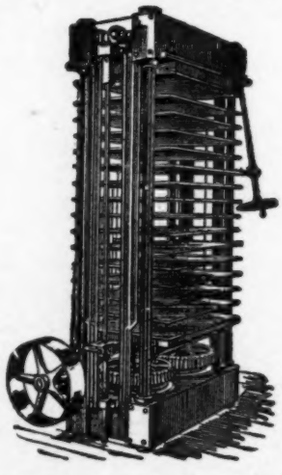

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FRANKFORD, PHILA.

contract for the erection of five large buildings, entailing an expenditure of approximately $3,000,000. Three of the plants will be located in Durham, one in High Point and one in Mebane. The Marvin Carr Memorial Mill, to manufacture silk hosiery, will be built in Durham, and will cost about $1,000,000. The High Point plant will also make silk hosiery. The Mebane plant will be a spinning mill and will cost about $1,000,000.

The Buster Brown Hosiery Mills No. 9, Birmingham, Ala., will build a large addition.

The Fall City Knitting Works have been incorporated at Louisville, Kentucky, with $10,500 capital to manufacture sweaters.

The Carthage (N. C.) Hosiery Mills, of which S. J. Hooks is manager, will add a dyeing and finishing department.

It is reported the Browning Hosiery Mills, Chattanooga, Tenn., will increase their capital stock from $25,000 to $50,000 and will enlarge their plant.

The Barnes Knitting Company, a temporary organization, at Cedartown, Ga., has applied for a charter. When this is granted, permanent organization will be effected and officers elected. The paid-in capital stock is $50,000. All the knitting machinery has been purchased, a building secured and it is expected that operations will begin about the first of April. The mill will start with an output of 250 dozen men's fine half-hose per day and will employ about 50 people at the start.

The accompanying illustration is a reproduction of an improved steel rotary dyeing machine which is manufactured by the Rome Machine & Foundry Company, a southern manufacturing establishment, located at Rome, Georgia. The machine shown in the illustration contains three compartments, each of which has a capacity of 100 pounds. The dyeing capacity of this machine is 1,200 pounds per day. The outside casing tank is also of steel construction. This machine is manufactured in several sizes. Further information may be secured from the company manufacturing these machines, to which all inquiries should be directed.

Saving Waste in House Building.

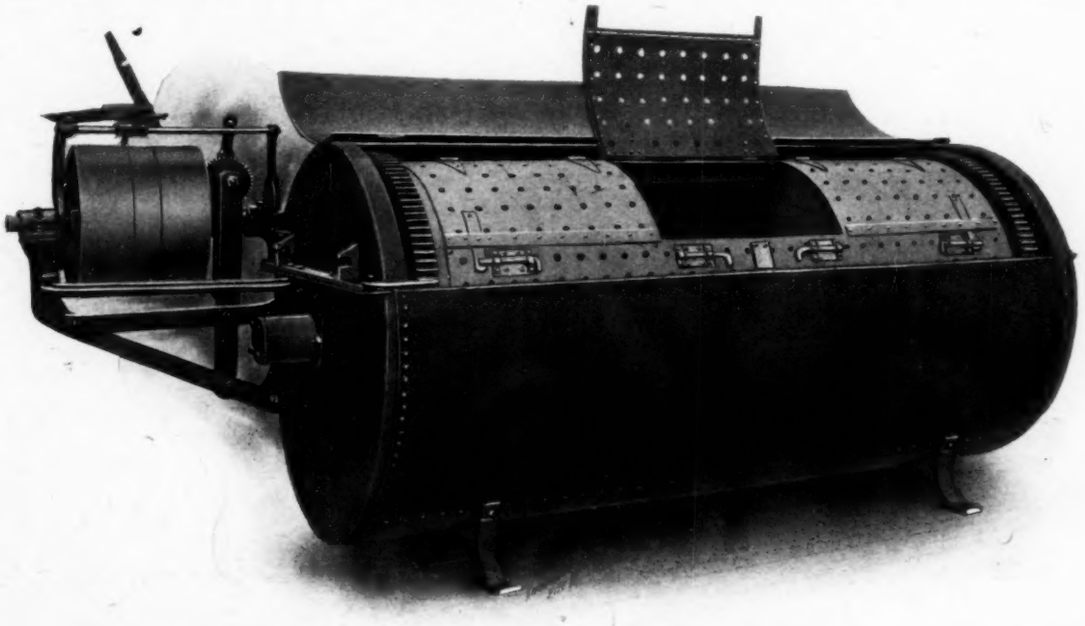
The Aladdin Company, who are said to be the largest manufacturers of readi-cut houses in the world, are now doing business on the Atlantic coast. Mills and general offices were opened in Wilmington, North Carolina, last month, and shipments from this mill will start immediately. The Aladdin Company are the manufacturers of the Aladdin home and now have mills and general offices at Bay City, Mich.; Hattiesburg, Mississippi; Portlond, Oregon; and Wilmington, besides a Canadian branch at Toronto, Ontario.

They began business 14 years ago at Bay City, with a small mill. W. J. Sovereign, president of the company, originated the "cut-to-fit" idea of home construction and he with his brother, O. E. Sovereign, treasurer and general manager of the company, own it.

Mr. Sovereign's idea grew from the thought that a house could be built cheaper by buying the material all cut to fit and ready to be nailed in place and at the same time could be erected quicker. His idea was not to get together a portable house but to cut to the proper lengths at a mill all the lumber that goes in a house, to have a number of standard designs, and by knowing what lengths of lumber were necessary, to be able in this way to eliminate much of the waste of lumber that was so apparent under the old system of building.

Working on this idea, he, with his brother, commenced to manufacture such houses and found a ready market for them. Over 50,000 Aladdin homes have been erected in various parts of the United States, Canada, Great Britain, France, Mexico, and other parts of the world.

At the start of their work, the Sovereigns decided to make their leading business principle "Service." They decided that they would strive to please each and every customer and their big success is evidence that they have, in the main, succeeded. Proof of this is the large number of Aladdin homes sold each year, many being disposed of



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1770—1920

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C. B. CARTER, Secretary

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612 CHESTNUT STREET PHILADELPHIA, PA.

through the efforts of former customers who have induced their friends to buy as they did.

The Aladdin Company sells directly from the mill to the customer and in this manner the sales cost is cut to the lowest possible point. They have no agents, no brokers, no middlemen, and their houses are shipped directly from the mills located in the various cities mentioned, to the persons who buy them.

Starting with a small capital and hence only a few different styles of house designs they have grown to that point where their catalog contains nearly a hundred different types of houses, large and small, and in addition to the houses they manufacture garages, barns and summer cottages. They do a large industrial business, that is, selling complete cities to industrial concerns about the country who desire to erect them for their employees. These cities include schools and other public buildings that go to make up the modern town of today. This sort of manufacturing received a great impetus during the war.

Shortly after the commencement of the war the company was detailed to erect a cantonment at Fort Snelling, Minnesota, and in 26 working days, they put up barracks, heating plants, and a water system sufficient to care for nine thousand men. This is one of the quickest construction feats on record and speaks volumes for the efficiency of their system of building.

It is estimated by the Bureau of Census that the normal excess of families over dwellings in the United States at the present time is 23 per cent. In 1890 it was about 10.5 per cent and has been increasing ever since. To cope with this increase The Aladdin Company has started what they call a National Homebuilding Service. They have divided the country into four sections or divisions, the northern division, the south central division, the southeastern division and the western division. In each of these divisions they have selected a city, centrally located, with good shipping facilities, for all their houses must be shipped by freight to the customer, and near a supply of standing timber, and have there opened general offices and constructed mills. In this way they aim to serve every part or section of the country in the most efficient manner. By locating at a railroad center, shipping facilities are better and by being centrally located in the territory, freight rates have been brought to the minimum.

The company issues a handsome catalog of over one hundred pages which tells in full of the system of construction and the leading points of Aladdin homes. It is beautifully illustrated in colors. Many thousands of these catalogs are sent out each year and they act as the salesmen of the company. In addition to the catalog the company issues a weekly magazine, called Aladdin's Weekly, to its customers and prospective buyers, which contains useful news on building matters and conditions in general.

In choosing Wilmington as the site for the southeastern mills and offices, one of the best railroad centers in the division was chosen. It is centrally located and with shipping both by rail and by water possible, it was felt that the best possible service could be given the company. The lumber supply adjacent to this mill is good. The pine forests of North Carolina are only a short distance away and these can be easily tapped.

The southeastern division of the company includes the states of North Carolina, South Carolina, Georgia, Florida, Virginia, Maryland and Delaware. All the mail from these states will be handled at the Wilmington office and shipments of Aladdin homes to all points in these states will be made from the mills at Wilmington.

One of the leading points in the Aladdin system of construction is to save as much waste as possible and thus reduce the cost. All the material for these houses is cut at the mill from which it is shipped. The necessary lengths of sheathing, siding, studding, etc., that is to be used in the different style houses are known before the lumber is cut at the sawmill and each board is cut the required length. By this system waste is practically eliminated.

Experts of the company have figured that at least 18 per cent of the lumber bought to construct a house under the old method of cutting it on the property where the house is to be built, is wasted, and give facts to prove the correctness of their statemtnts. Under their method of construction and by the use of modern machinery in their mills they claim they have cut out this item of waste to less than 2 per cent.

Figuring along these lines they also estimate a great saving in labor. Where the lumber is received all "cut-to-fit" and ready to be nailed in place, they estimate that the labor cost is cut over 30 per cent.

Because they do business on a large scale they claim that the quality of lumber used in their houses, and in fact everything that goes to make up an Aladdin home, is at least as good and many times better than can be secured elsewhere. Millions of feet of standing timber are bought by this concern each year and because of the great volume of their business they are of the opinion that they can give a better product at a cheaper price.

Today volume production is one of the big issues that has cut the costs of many necessaries and brought them to a reasonable limit. So the argument they give as to better products at a cheaper price is most tenable. So with their motto "He profits most who serves best" the Aladdin Company have forged their way ahead, and though they have already four separate and distinct mills in as many different cities and sections of the country, the end of their expansion is not yet in sight.

Keep the Stair-Steps Sanitary.

One of the chief hiding places for dirt in factory buildings is in the corners of stairways. It is very hard for a person sweeping with a broom or mop to remove all the dirt in the corners and the accumulation of dirt provides a breeding place for bacteria. Corners are usually dark and more or less shaded and it is sometimes impossible to see whether or not there is dirt there.

A move that is sometimes taken to aid in keeping these corners free of dirt is to paint the corners in white. This at once shows up the presence of any foreign matter and it is much easier for the sweeper to see that the corner is clean. It costs very little in labor and paint to produce this sanitary improvement. Dirt then has little chance to hide.

The child in the primary grades of school is taught axioms which in themselves seem to be rather paradoxical. For example, he is told to "look before you leap" and then is warned **"he who hesitates is lost."**

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Industrial Organization.

(*Continued from page* 288)

more or less than the reflection of disorganization, lack of co-ordination and the absence of well-defined policies at the top.

In other words, proper organization, well-defined policies and co-ordination at the top work automatically toward betterment at the bottom. It is the case of "charity begins at home." Workers cannot be expected to be satisfied, contented and willing to give their employer their best when the executive organization is all out of joint and working at cross purposes.

I became so firmly convinced that industrial success or failure depended entirely upon whether a concern was organized or disorganized that I have endeavored to reduce my experience and the experience of my associates to a concrete basis in an effort to establish the following laws of organization:

A tentative plan of organization should be worked out and decided upon. Owing to the presence of unknown factors, which cannot be determined in advance, the ultimate objective cannot be agreed upon at the outset, in fact, it will be well toward the completion of the work before the final type of organization can be settled upon. No plan can be worked from the top down in its entirety, nor should one be worked altogether from the bottom up, for this would result in a development lacking co-ordination. The game should be one of "playing the ends against the middle."

A business or a department should be considered with reference to the most difficult functions with which the men in charge will be called upon to undertake.

The evolution of industry from a one-man stage to that in which many men are needed for the handling of specific things, has been based, consciously or otherwise, on the "law of greatest complication." In manufacturing, for instance, there was no doubt a time when the same man could both design and sell what was to be made and then go out in the shop and make it. But as the knowledge required of a man to design, sell and to make, became greater and more complete and intricate, it became necessary to form two sections or departments, each of which took over one of the functions named. Each department was placed in charge of a specialist, and both departments were supervised by the man who formerly handled all the details himself.

In other words, the "law of greatest complication" demands that instead of trying to find a man who can handle all the work himself, it is better to create a department divided into the most difficult functions which the man in charge will be called upon to cover.

Each section, division, or department of a business should be so arranged as to contain all the factors which will effect the performance of only its own function. If such a plan is adopted, the head of the work can be held strictly responsible for the successful conduct of his department, as he controls all the factors in connection therewith and can therefore be given to understand that he will stand or fall according to his showing.

A battle cannot be won by half a dozen generals, all of whom have equal authority. There must be one-man control. There is nothing more confusing in an organization than for employees to have more than one man to whom they are directly responsible, and nothing that so quickly destroys discipline as to have a manager go over the heads of his subordinates. Yet these are among the faults we find most frequently in organization work.

Too many men are hired and placed in organizations and left to work out their own salvation. When a man enters an organization, his duties and all matters which he is to be held responsible for should be definitely stated to him. In addition, he should be told who the head is to whom he is responsible for carrying out his duties, as well as who the men are who will be responsible to him.

An organization should be divided so as to develop specialists. Specialists are developed by allowing men to work in a limited field of knowledge. In other words, a man is so developed that instead of knowing many things superficially, he will know a few things extremely well.

In an organization of specialists there is no difficulty in finding men to fill competently executive positions, for the average man with executive ability can handle efficiently a large amount of work in a limited field of knowledge.

An executive should be held responsible for the total proved results, or for inability to secure results, and not for the details of the methods that he uses in trying to secure these results.

It is a frequent fault in organization that the bigger executives—especially those who, when the concern was small, followed all details—judge the executives under them by various details that they find wrong, instead of judging them by the total proved results in that section of the business for which those minor executives are responsible.

When men are called to account for details that they have been in no position to know, and are also made responsible for their ignorance, as a matter of self-protection they will begin to follow up all the details of their departments so as to be familiar with them and be ready to explain this or that to the management. They naturally become overburdened with detail work and neglect to spend any time on their most important work, which is the study and improvement of the departments in their charge.

What would happen if, during an engagement, a member of an artillery squad, or of a gun crew on a battleship, should suddenly be killed, and none of the others should know what to do in his place? The consequences would be serious indeed. And yet in industry we find many cases in which no provision has been made for training men to fill the positions of their superiors, in case anything should happen to the latter. A man may at any time be transferred, or he may die, or be taken sick, or resign his position, or take a vacation, or be dismissed from the employ of the company. In any of these cases, it will be the duty of someone else to fill the gap at least temporarily, perhaps permanently, and if no one has been trained to take over the new work, results are bound to be unsatisfactory, if not disastrous.

The question of selecting the personnel of an organization and of training those who compose it should be given very special consideration. I am familiar with the works of Walter Dill Scott and Munsterberg. I have read the books written by Dr. Blackford on "Character Analysis," and the one by Kemble, on "Choosing Employees by Test." Still, I must confess that the deeper I go, the more out of breath I am, when I emerge.

There is no getting away from the fact that many men base their choice in engaging employees on the advice of

some other person; then, if they are satisfied, all well and good; if not, they make another selection. A man is wanted for a certain place, and applicants are examined. The usual method is to size up each man, listen to his story, ask some general questions, and look up his references, which sometimes amount to little as an indication of his real worth. If engaged, the man may be successful, and he may not.

We generally fail to have a set of specifications covering what we really want. Hiring men is, or should be, like purchasing materials, in that there should be, first of all, definite knowledge of what is required. After all, it is a case of matching qualifications against requirements. If we know what we want, we can check the merits of the material that we examine. For instance, if a position demands close application, long hours, and indoor work, it is sheer folly to engage a man who loves the open and therefore detests confinement and close application. He would naturally be inefficient because discontented and unhappy. If it is essential in buying a machine to lay down certain specifications, and then make sure that the machine measures up to them, it is just as important to have specifications in regard to the men we shall engage, in order that we may check their qualifications against them.

With reference to these laws of organization for man-building, as they pertain to the managers and executives, certain essentials have been discovered after a long study of the managements of industry It has been found that the man with the highest type of initiative is the one who sees things to be done, without being informed, and who then delegates to others the task of doing the work. The man with the next highest type of initiative is the one who sees things to be done without being informed and who then does the work himself. The next in order is the man who sees things to be done, after being informed, but who does the work without being told. I need not mention any other classes.

In other words, a man's power in business is measured by the extent to which he induces efficiency in others and at the same time gives the least possible attention to duties other than his own. This is a good business law because while there is a limit to the amount of detail a man can handle, there is, however, practically no limit to the amount of supervision he can exercise, since in supervising he is merely guiding others.

It is, of course, true that a man of strong personality desires to do things himself, since he feels that he can do them better than any other. In a sense he may be right, but if he is wise he will not attempt too much. If he does, however, he not only limits himself, in that he cannot plan and scheme and do at the same time, but he is failing to develop initiative in those about him, and in time he will have a force of "leaners."

No man knows what he can do until he has a chance to demonstrate what is in him, and there is no man who is not able to do more than he believes himself capable of. I have time and time again found a man of only average ability who was a "leaner," but who developed unusual ability when given definite responsibility and the necessary authority whereby to get results, with the understanding that if he failed he should make way for some one who could "make good."

A word at this point with reference to the functions of an executive seems in order. My experience has shown that the real functions are:

a To exercise general supervision over the business or the department.

b To analyze results critically.

c To put new problems before his men for their consideration, advice and action.

d To criticize subordinates when results are not forthcoming, setting forth the reasons why.

e To see that prescribed practice is lived up to.

No man who attempts to do everything himself can be a master business builder; he must deputize authority among competent assistants. An executive should examine himself carefully, and frankly decide what his business capacity really is. Then he should analyze his work, classify it, and in three columns, A, B. C, list the various duties, in the order of their importance. The "A" duties he should attend to himself, the "B" duties he should delegate to his immediate subordinates, and the "C" duties he should give over to those in less responsible positions. The results accomplished, as compared with the old plan, would be tremendous.

To fuss over details is to waste time that could better be devoted to more important matters. If you engage a man to do a certain thing, it is presumed that you have taken care to select the right man for the position you desire to fill. The man is expected to do a specific work, is responsible for the accomplishment of certain definite results, and therefore, has, or should have, certain well-defined duties to perform.

Nothing will so hamper a man as too constant supervision, designed to check him up minutely with respect to the details of his work, and if he is a real live, competent individual he will resent such a policy in time and seek employment where he can exercise his powers to the fullest.

Further, men prove themselves worthy of responsibility only if they are given full authority in their particular spheres. To say that there is responsibility where there is not full authority, is to express a paradox.

The executive who disregards his immediate subordinates and deals directly with those immediately under these subordinates or with the workmen themselves, is unjust to the men whom he has placed in positions of authority.

The manager of the future will not be a manager at all, at least not according to the present interpretation of the term; he will be a co-ordinator and a guide. Primarily, instead of doing, he will decide; rather than counsel, he will seek advice; instead of achieving, he will endeavor to inspire others to achieve. He will not spend his time on details, he will delegate them to others.

The executive of today learns through experience and attains his position only after a gradual development, the basis of which is a thorough theoretical knowledge of his field, and constant contact with the workers.

The manager of the future will be every inch a man. He will love men, and will work with them to make them better men. He will study men, for in the last analysis men are, and always will be, the foundation of industry and civilization. Even if all money and all property were destroyed, and only one man and God-given resources (trees, water, the mine deposits, and animal life) were left, still man would erect a civilization even greater than that in which we now live. Man is the foundation; therefore, know man; for a thorough knowledge of man, and of men, will be the keystone in the industrial structure of the coming age or cycle of development and refinement.

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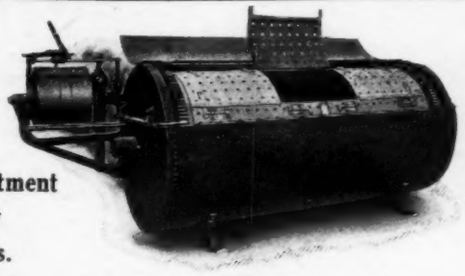

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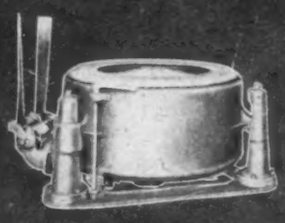

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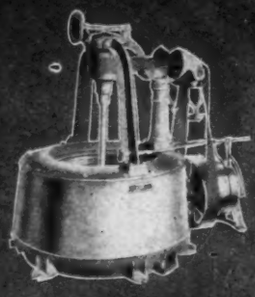

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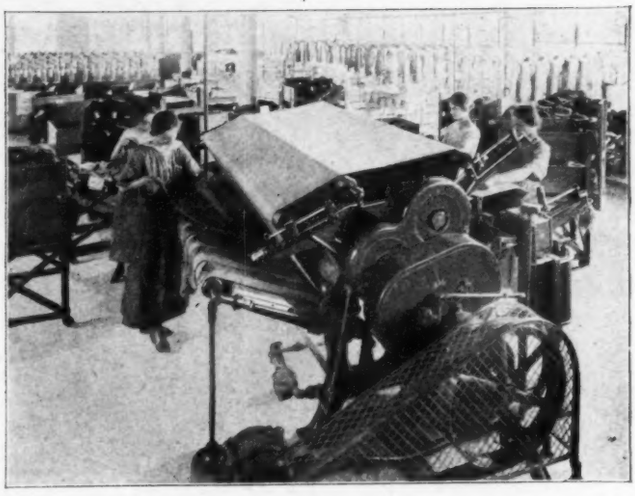

These four girls and the American Rotary Hosiery Press finish the entire hosiery output of The World Star Knitting Mills, of Bay City, Mich.

This mill finishes its entire hosiery output with *this* press

The World Star Knitting Mills, of Bay City, Michigan, finish their entire output of hosiery with an American Rotary Hosiery Press. This includes ribbed, cotton, mercerized, and all silk hose in men's, women's and children's sizes.

But saving of time and labor in pressing hosiery is not the only advantage this company derives from its American Rotary Hosiery Press—its salesmen find that the product finished on this machine is easier to sell. The soft sheen and lustre of the hosiery favorably impresses the customer—the dealer buys more readily, sells more easily, and the "ultimate consumer" thinks more of what he purchases.

One of these Presses and four girls or boys will finish the same amount of work as 8 to 12 strong men with other methods—in a word, this machine will relieve 4 to 8 workers for other duties and save the space the old machines occupy.

The American Rotary Hosiery Press will do for you just what it has already done for more than 60 mill owners—increase production, save time and labor, and reduce finishing costs. Write for particulars.

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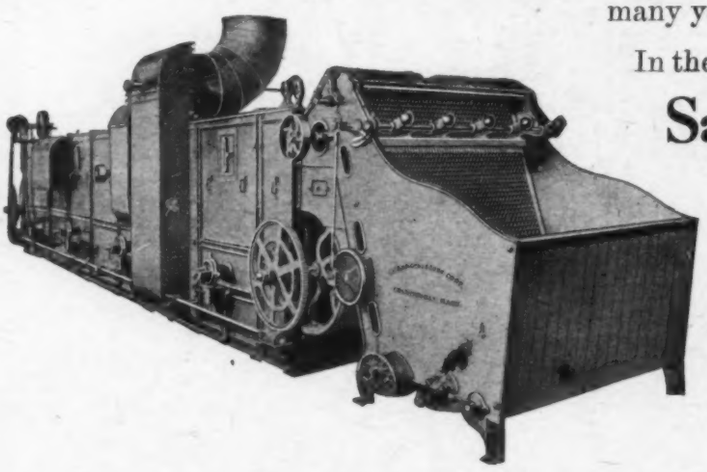
SARGENT DRYERS mark progress in Dryer Development comparable to that made in other fields of mechanical endeavor.

They are favored with a natural preference because they are designed on basic principles of air circulation, conveying, and general drying apparatus construction, which have had the approval of discriminating mill men and drying engineers for many years.



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these principles have been combined and refined, making a complete machine which is unexcelled.

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THIS machine has been thoroughly tested out with all colors and under all conditions, and is guaranteed to give the very best results possible in the dyeing of hosiery.

The stock is carried in four perforated metal containers equipped with one removable head on each container, and the containers mounted on Spiders in such a manner as to permit of their being loaded and unloaded quickly from the machine.

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Machines are furnished with either belt or motor drive.

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1st—Matting and chafing of the stock is entirely eliminated.

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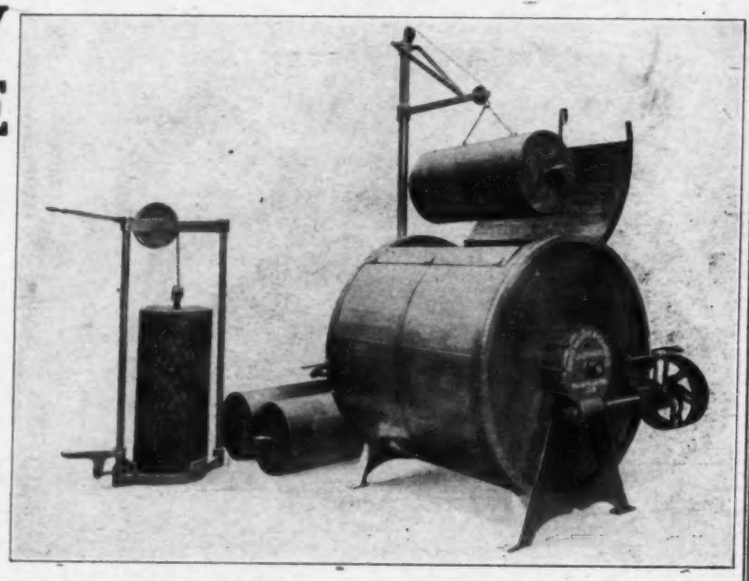
3rd—Different sizes and descriptions can be handled in one dyeing without confusion.

4th—Time required for loading and unloading machine reduced to a minimum.

5th—Absolutely level dyeings on all colors.

6th—Minimum of power required for operation.

For further particulars and prices write or wire.



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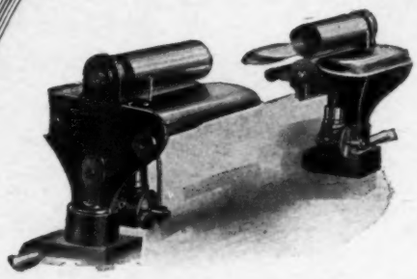

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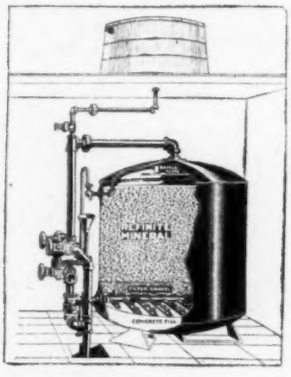

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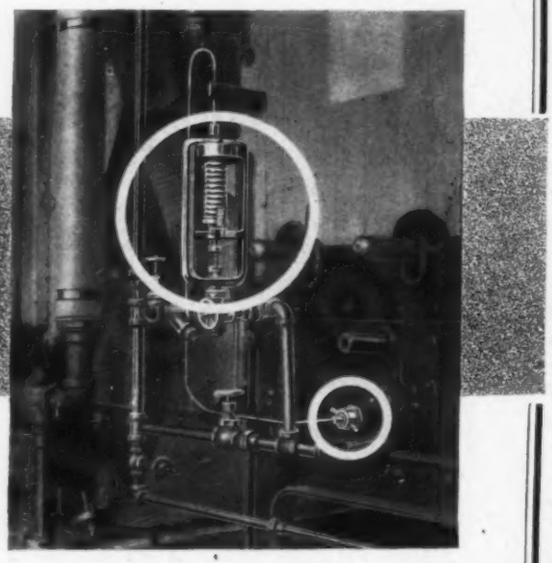

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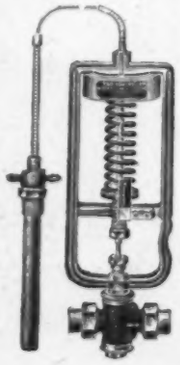

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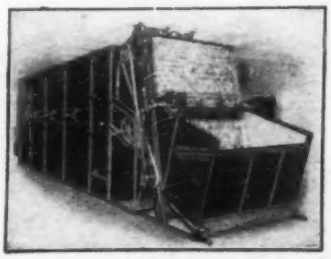

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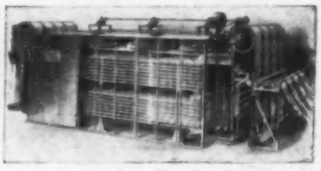

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of COTTON UNDERWEAR, Gloves and Hosiery for MOCK EGYPTIAN and Other Light Shades

simultaneously dyeing to shade and eliminating all specks, motes, leaf and shives in one operation and in three hours time, by the use of AUTOGYP which is the registered name of the chemical used in the process.

The Material Direct From the Knitting Machine, is run into the dyeing machine, and thoroughly wet out in any convenient manner. Sufficient cold water to thoroughly cool the bath and in which to properly work the material is now run into the machine. 2 to 3 per cent. of Autogyp dissolved in cold water and suitably diluted is now added to the bath. The necessary dyestuff in a well diluted solution is then slowly added to the bath and the goods allowed to run 10 minutes. Steam is then turned on and the bath allowed to come to a boil very slowly and gradually and held at or close to a gentle boil for one hour; steam is then shut off and the goods allowed to run 45 minutes longer without steam.

The Bath is then drawn off and the goods rinsed twice and extracted.

—AND
THAT'S ALL

Write for a free demonstration of this wonderful process to the

SURPASS CHEMICAL CO., Inc.
Albany, N. Y.

BOSSON & LANE

Manufacturers and Importers

Castor Oil and Castor Oil Products

Turkey Red Oil	Soluble Grease
Alizarine Assistant	Soluble Wax
Castor Soap Oil	Soluble Rosin
Bleaching Oil	Olo Soffene
Monoline Oil	Snoflake Softener
Victroline	T. R. Soap
Soluble Oil	Oleine

Flaxhorn—The Delicate Finish.

Works and Office: ATLANTIC, MASS.

Starch

EFFICIENCY and ECONOMY are the watchwords today. Modern mill men who hold to this motto are discarding ordinary, imperfectly refined starches and selecting those special types best suited for their individual conditions.

Some desire increased weight, all need increased strength and better weaving qualities for the warp.

You know the result you seek.

We know and can provide the proper type of Starch.

EAGLE FINISHING

C. P. SPECIAL FAMOUS N

BLEACHING and FINISHING PLANTS have learned that "any old" STARCH or DEXTRINE will not do the work. To secure the proper "feel" the desired weight, the attractive finish, careful discrimination must be exercised in selecting

STARCHES and DEXTRINES

We manufacture all approved varieties.

500 MILL 400 MILL

BLUE RIVER CRYSTAL

DEXTRINES and GUMS

Corn Products Refining Co.

New York

Southern Office *Greenville, S. C.*

Starch

1872 1920

CHEMICALS, DYESTUFFS COLORS, GUMS, OILS

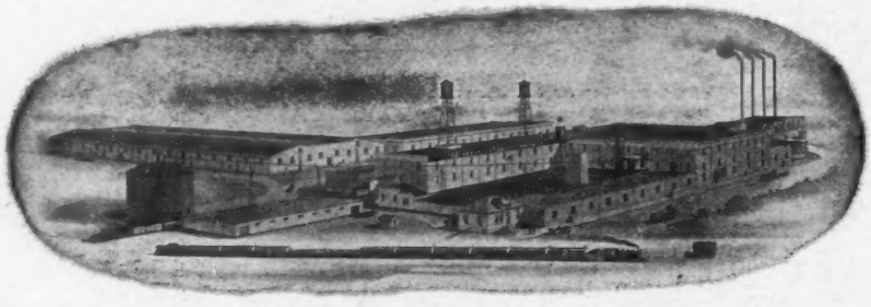
FOR THE TEXTILE INDUSTRY

HEADQUARTERS FOR

ACID, BASIC, DIRECT, CHROME and SULPHUR COLORS; "CIBA" and "CIBANONE" FAST VAT DYES

A. KLIPSTEIN & COMPANY

644-652 Greenwich Street NEW YORK CITY



VICTOR MILL STARCH

The Weaver's Friend

It boils thin—it penetrates the warps—increases breaking strength and carries the weight into the cloth. Being thoroughly washed free of gluten and other foreign matter it gives a bleach and finish to the goods that you can get from no other starch.

A trial order will convince you that VICTOR STARCH has no equal on the market.

THE KEEVER STARCH COMPANY, Columbus, Ohio

Southern Agent: MR. JAMES H. MAXWELL, Greenville, S. C.

If you are not already using VICTOR STARCH call on our representative for a demonstration at your convenience

BOSTON PHILADELPHIA CHICAGO COLUMBUS, GA.

ANILINE DYES and CHEMICALS, Inc.

Cedar and Washington Streets
NEW YORK

SULPHUR BLACK, A.D.X.

A concentrated color and the adopted standard of many of the largest consumers

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All the Leading Hosiery Shades

Mercerizing Gassing Bleaching

We have a new and strictly modern plant for mercerizing, gassing and bleaching.

Located as we are in the center of the combed yarn spinning industry of the South, we are enabled to furnish you with the highest quality processed yarns in all numbers.

The American Processing Company

Mount Holly, N. C.

NEW YORK REPRESENTATIVE:
H. B. ROBIE,
No. 346 Broadway,
New York City.

SELLING AGENTS,
THE RIDDLE COMPANY,
Mariner & Merchant Bldg.,
Philadelphia.

THIS
CONVINCING COMPARISON
SHOWS THE SUPERIORITY OF

SIGNODE SYSTEM

OVER THE USUAL BALE TIE.
LET US SEND YOU FULL DETAILS
SIGNODE SYSTEM, INC.
CHICAGO ATLANTA
Boston New York Philadelphia San Francisco
Toronto

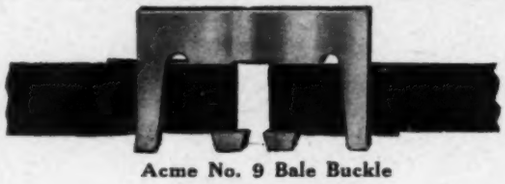
$\frac{5}{8}$" x .015 SIGNODE TIE	COSTS 12 % LESS PER FOOT	HOLDS UNDER 800 LBS. PULL	NO "SPIDER" TO INJURE HANDS
Compared with			
USUAL $\frac{5}{8}$" x .017 BALE TIE	COSTS 12 % MORE PER FOOT	BREAKS UNDER 500 LBS. PULL	DANGEROUS "SPIDER" OFTEN PRESENT

SEND YOUR BALES TO MARKET IN GOOD SHAPE

OUR Sewing Twines are made of Cotton, Hemp or Jute as best suited for the work to be done.

Utmost care is exercised in the choice of fibres. They are thoroughly cleaned by modern processes of manufacture so that all the dirt and imperfections are removed.

Henry C. Kelley Company
New York Atlanta



Acme No. 9 Bale Buckle

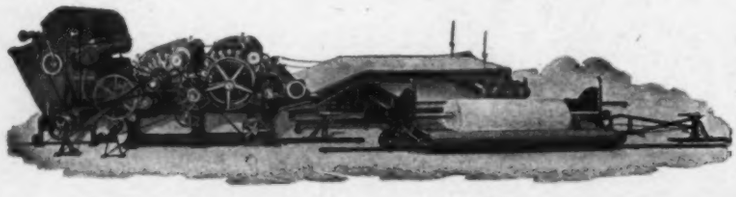
ACME
Cold Rolled Bale Ties
USED WITH
Acme Bale Buckles
OR
Acme Seals
MAKE
Better Bales

Acme Steel Goods Company
ATLANTA, 10-14 TIFT STREET
BROOKLYN, 167 41st STREET
CHICAGO, 2840 ARCHER AVENUE

Acme Nailless Strapping with Seal applied

SMITH & FURBUSH MACHINE CO., Philadelphia

Specialists in machinery for working all kinds of waste products. Machinery for coarse waste yarns, mop yarns, rope; for shoddies, for wiping waste; for re-woven jute bagging, etc.



FELTING OUTFITS

for making batts or felts for mattresses or comfortables.

We build complete outfits of machinery for all kinds of felts.

Send for Catalog S-15

Let Him See What's Right

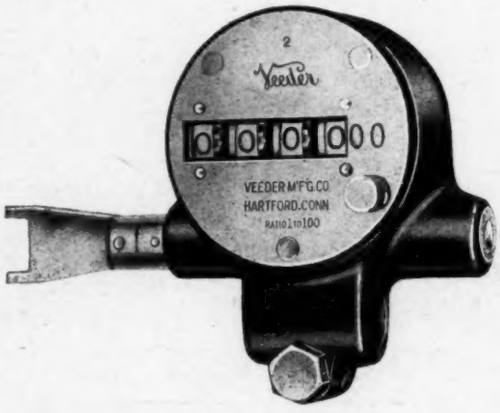
Before expecting a good day's work from your operative, let him see for himself how much he ought to do.

Nine times out of ten he'll do what's right by his employer, if he's fully convinced the requirements are only fair.

There's no getting away from the records of

Veeder
COUNTERS

as to the capacity of the different machines, and the *output*-obligations of those that operate them.



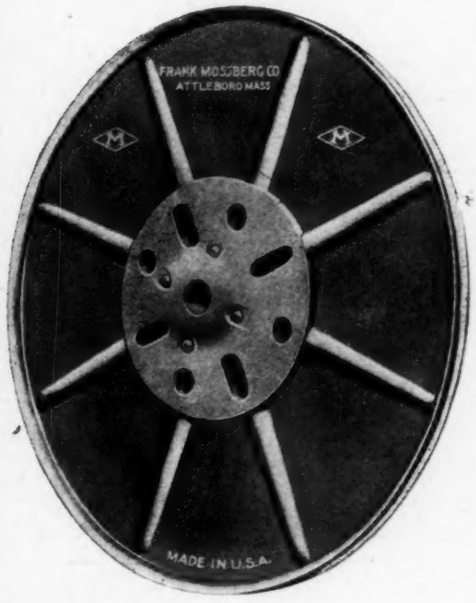
This is a much-reduced view of the new Loom Pick Counter, built larger than former models —more size to the figure-wheels, more legible readings—with the added endurance of a heavier number-mechanism. Intended to be driven from the crankshaft, and registers the output in hundreds or thousands of picks, as ordered. Reads in plain figures; there's no mistaking the count; no disputes. *Textile Counter booklet describes this and other counters built exclusively for textile machinery.* Copy free.

The Veeder Mfg. Co.
6 Sargeant St., Hartford, Conn.

MOSSBERG

STEEL BEAMS AND SPOOLS

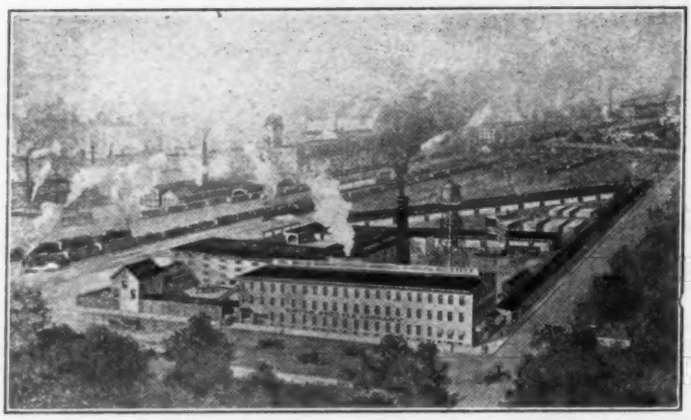
It's good business to buy Pressed Steel Beams, Reels and Spools, because the cost of repairs and replacements makes wood construction the most expensive. Steel is stronger and lighter than wood or cast iron.
No more split, cracked, splintered, warped or chipped beam heads or reels, when you use
MOSSBERG
PRESSED STEEL CONSTRUCTION
Because of the obvious superiority, mills all over the country are standardizing on Pressed Steel, saving money and the time wasted by frequent purchasing.
Send for catalog of Standard Pressed Steel Beams, Reels and Spools which take care of practically all winding and reeling requirements



FRANK MOSSBERG CO.
ATTLEBORO, MASS., U. S. A.

The David Brown Company

Factories Lawrence, Mass. U. S. A.



High Grade Bobbins, Spools, Shuttles and Skewers.

Facilities are the Best.

Correspondence Solicited.

SPOOLS

Let us submit prices and samples on WARPER and TWISTER SPOOLS. Plain wooden head and metal shield. A list of Southern Mills using spools given on request.

Greenville Spool & Mfg. Company

Greenville, S. C.

The Palmer Adjustable Thread Guide

For Ring Spinning and Twisting Frames

Easily adjusted.

Extreme accuracy and permanence of setting.

Cheapest of them all.

Mail guide-block for free sample.

Patented and manufactured by

THE I. E. PALMER COMPANY

Middletown, - - - Connecticut

AMERICAN SUPPLY COMPANY

PROVIDENCE, R. I.

MANUFACTURERS OF

Loom Harness,
Weaving Reeds,
Oak Tanned Leather
Belting, Strapping,
Etc.

We make a specialty of Harness for Warp Drawing Machines

NOTE—No orders too large for our capacity. None too small to receive careful attention.

FIG.20.

All our Baskets made from Lane Duck of our own weaving.

By use of strictly long staple cotton and approved modern methods, unusually high tensile strength and wearing qualities are obtained.

LANE

Canvas Mill Boxes and Trucks

•

Standard American Equipment

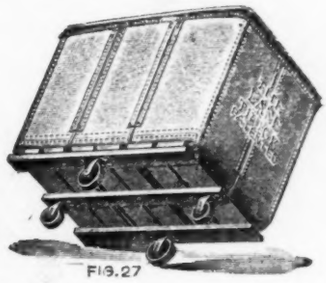
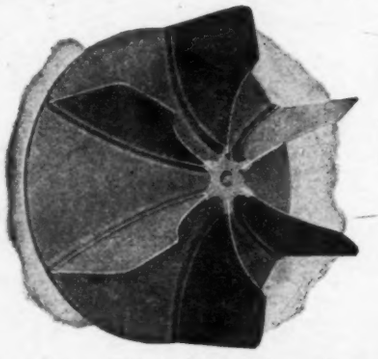


FIG.27

This Truck embodies all the advantages of Lane Baskets, plus our special designed Thread-guard Casters which are, in fact, non-clogging. Furnished in either stationary or swivel frame style, of generous diameter and tread.

W. T. LANE & BROTHER, Manufacturers, Poughkeepsie, N. Y.



Here's the Fan Wheel

That Has Made These Reversible Fans So Universally Successful in Cotton Mills

This fan wheel is the secret of the success of our reversible fans for conveying Cotton, Wool, Rags and Stringy Material of any kind.

This fan wheel is constructed with a cone-shape back of cast iron with sheet steel blades cast solid. Note the short overhang, which makes the fan run smoothly without vibration. This wheel offers less resistance to material passing through than any other wheel. It handles long, stringy material just as good as short material or lint.

And it's reversible.

The fan is built solid and runs without a tremor at maximum speed. No buckling of suction at high speed. No rivets to work loose. Universal adjustment of bearings, not simply up and down.

Made in any size, from 30 to 60 inch.

Folder R. F. explains fully. Ask for it today. Our catalogs No. 65 and 67 show complete line of fans and blowers for every class of work.

We have a large stock of repair parts which can be shipped at a moment's notice.

BUILT RIGHT RUN RIGHT

The New York Blower Co.

513 Transportation Bldg., CHICAGO, ILL.

Works: LA PORTE, IND.

Leader-News Bldg. Cleveland, O. 502 Plymouth Bldg. Minneapolis, Minn. 303 B. F. Jones Bldg. Pittsburgh, Pa. 1121 Nicholas Bldg. Toledo, Ohio. S. W. Life Bldg. Dallas, Tex.

E. C. Atkins Co., Memphis, Atlanta and Indianapolis, Ind.

370 Central Ave., East Orange, N. J.

Leatheroid

"Leatheroid" No. 2 Warehouse Car

"Leatheroid" No. 3 Warehouse Car

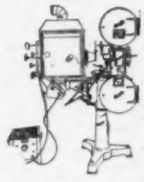
The Best Mill Cars Money Can Buy

Leatheroid Roving Cans, Mill Cars, Mill Boxes, Mill Baskets and Doffing Cars are made in a variety of sizes and shapes. A booklet containing pictures and full information will be mailed on request.

Sold by the Leading Southern Mill Supply Houses

ROGERS FIBRE CO.
LEATHEROID DIVISION
1024 FILBERT STREET
Philadelphia
PA.

Simplex
PROJECTORS



ARE THE TYPE MOVING PICTURE MACHINE TO BE FOUND IN THE WORLD'S FINEST THEATRES, SCHOOLS, CHURCHES AND INDUSTRIAL PLANTS—IF YOU CONTEMPLATE INSTALLING PICTURES IN YOUR RECREATION HALL IT WILL BE TO YOUR ADVANTAGE TO LET US FIGURE WITH YOU—REMEMBER! WE CARRY A GIGANTIC STOCK OF MACHINES, SCREENS, CHAIRS AND EVERYTHING PERTAINING TO THE THEATRE, SCHOOL OR AUDITORIUM. WRITE FOR COMPLETE CATALOGUE AND DETAILED INFORMATION. WE EMPLOY A CORPS OF EXPERTS AND ARE AT YOUR SERVICE—MANY YEARS OF SUCCESSFUL OPERATION THROUGHOUT THE COUNTRY HAS BEEN ENJOYED BY THIS COMPANY.

SOLE SOUTHERN DISTRIBUTORS Simplex TRADE MARK PAT'D PROJECTORS

THEATRE ACCESSORIES
LUCAS THEATRE SUPPLY COMPANY
ATLANTA, - GEORGIA

"AMERICA'S GREATEST INDEPENDENT MOTION PICTURE MAIL ORDER HOUSE"

WHILE YOUR MILL IS MAKING SUBSTANTIAL PROFITS

is the time to equip with loom-harness whose service is measured from year to year instead of month to month.

"DUPLEX" FLAT STEEL HARNESS can show records of ten to fifteen years service at an average cost of ONLY 10c to 12½c PER SHADE PER YEAR with high cloth production and low percentage of seconds.

Let us quote you.

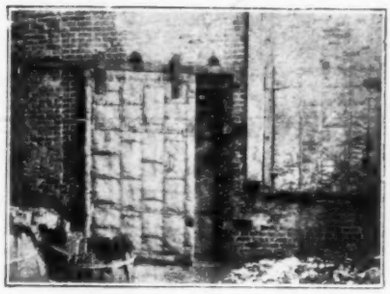
STEEL HEDDLE MFG. CO.
GREENVILLE PHILADELPHIA PROVIDENCE
Southern Office
111 Washington St. Greenville, S. C.
Hampton Smith, Southern Manager.

LOSS BY FIRE CAN BE CONTROLLED

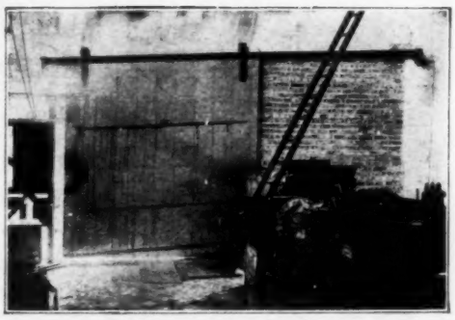
You cannot exclude from your establishment all causes of fire, but you can automatically control possible fire and confine it to a small section of a building, by protecting your plant with

RICHARDS-WILCOX

Automatic Fire Doors and Hardware



Part of R-W Fire Door Equipment which saved two-story building owned and occupied by Gillfil an Bros., at Milford, Ill., when conflagration destroyed all surrounding structures in September, 1918. Photo taken after the fire.



R-W Fire Door Equipment which saved $1,500,000.00 in fire at Universal Tractor Works, Moline, Illinois. On the opposite side of the wall, within five feet of this door, the intense heat melted machine bases and iron castings, and burned cement beams like wood. Note stains on the door where the enamel melted off the fixtures and ran down the surface of the door.

Inspected and labeled under direction of the Underwriters' Laboratories, Inc.

Stops fires at the beginning—before the fire department arrives—before the alarm is turned in—before the watchman knows there is a fire.

Write for Folder GF-17, showing actual instances of property saved by R-W Equipment.

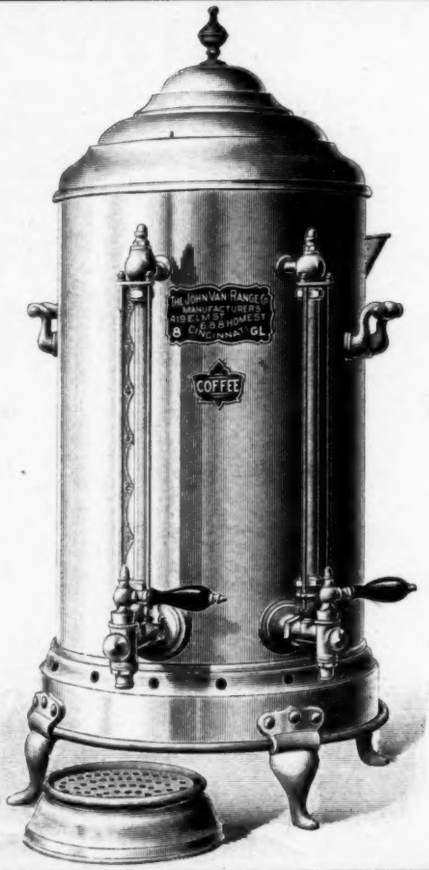
RICHARDS-WILCOX R-W AURORA TRADE MARK

Richards-Wilcox Mfg. Co.

A Hanger for any Door that Slides.

CHICAGO ST. LOUIS LOS ANGELES PHILADELPHIA — AURORA, ILLINOIS, U.S.A. — BOSTON NEW YORK MINNEAPOLIS SAN FRANCISCO — LONDON, ONT.

RICHARDS-WILCOX R-W AURORA TRADE MARK



Why ?

Because this is the **WRIGHT** investment to solve labor problems, increase production 25 per cent per employee, and pay a cash dividend. Three facts of vital importance for your mill.

We are now prepared to furnish Cafeteria Equipment for your mill, complete in every detail throughout your kitchen and dining room. We carry in stock in Atlanta the best, largest, and most complete Hotel, Restaurant and Institution Equipment ever carried in the South ready for immediate shipment. Our Drafting and Estimating Department is at your service to furnish Detail Blue Prints of Practical Layouts and Estimates for your kitchen and dining room, for which service there will be no obligation on your part whatever.

Write for our 300-page fully Illustrated Catalogue.

THE WRIGHT COMPANY

(INCORPORATED)

IMPORTERS *and* JOBBERS

HOTEL, RESTAURANT and INSTITUTION EQUIPMENT

185 PEACHTREE STREET ATLANTA, GA.

Wright Goods *Wright Price*

Wright Service

Wright GOODS-PRICES-SERVICE

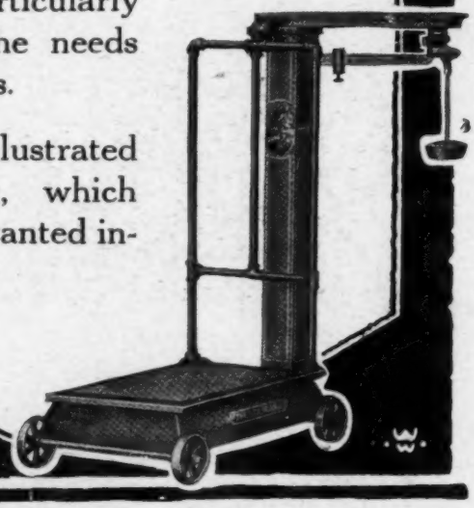
—No Guess Work Here

"THE STANDARD" SCALES

"The Standard" Scales admit of no guessing. They are accurate to the most minute degree—speedy—durable—and built to fit each particular weighing problem.

"The Standard" Scales give infallible service year in and year out, and are particularly adapted to the needs of textile mills.

Write for illustrated catalogue 85, which supplies the wanted information.



The Standard Scale and Supply Co.

PITTSBURGH, 1631 Liberty Ave.
NEW YORK, 145 Chambers St. CHICAGO, 163-171 N. May St.
PHILADELPHIA, 523 Arch St. CLEVELAND, 1547 Columbus Rd.
BALTIMORE, 409 N. Gay St.

Photograph of

Our Celebrated Coaster Slide

in Action

WE are the originators and patentees of the Wave Slide, patent No. 1239848. All persons are warned against purchasing other slides violating our patent. Write for our illustrated catalogue.

American Playground Device Company

AWARDED GOLD MEDAL PANAMA CALIFORNIA EXPOSITION 1915.

ANDERSON, IND.

Manufacturers of

PARK AND PLAYGROUND EQUIPMENT

PORCH AND LAWN FURNITURE

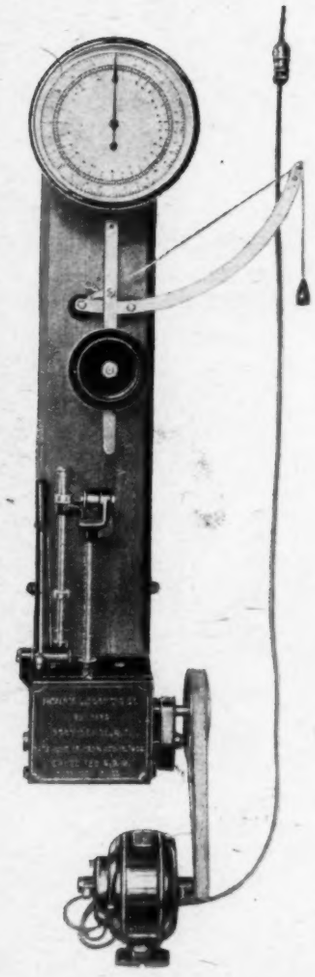
AGRICULTURAL, BABY CARRIAGE AND GO-CART WHEELS, STEEL AND RUBBER TIRE

SCOTT TESTERS

SCOTT AUTOMATIC TESTERS not only eliminate all uncertainty due to human influence, but actually save time and money.

For yarn, cloth, twine, cordage, rubber, etc.

Your successful neighbor uses them.



HENRY L. SCOTT & CO.
PROVIDENCE, R. I.

Modern Playgrounds Better Communities

Leading industrial concerns recognize the value of the playground, not only to their community, but to their institution as well. Add to the health and happiness of an employe's growing children, and you give to that employe an added happiness and contentment that he carries with him to his work. You promote loyalty, good will and genuine interest.

MEDART
PLAYGROUND EQUIPMENT

For 50 years the Medart Company has been manufacturing and perfecting gymnasium apparatus for vigorous men—an experience that has especially fitted it for the leadership it has always maintained in the development of playground equipment best suited to promote those bodily and mental qualities which mold today's childhood into tomorrow's man- and womanhood.

Send for Catalog "L."

Catalog "L" fully describes Medart Playground, Swimming Pool, Gymnasium and Locker Room Equipment. Contains valuable suggestions for playground installations. It will be sent gladly to anyone requesting it.

Fred Medart Manf'g. Co.
St. Louis, Mo.
Gordon Lewis, District Manager, Walton Bldg., Atlanta, Ga.

Bradley Stencil Cutting Machine

Do You Know

Where to Always Get

Scales
Cotton Trucks
Baling Presses
Baling Ties
Floor Trucks
Box Strapping
Cement Coated Nails
Steel Door Mats
Fire Extinguishers
Stencil Cutting Machines
Gummed Kraft Tape
One Man Trucks

The Lovingood Co.

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You Buy Direct When You Buy From Us

Warehouse and Office
14 Walker St.
ATLANTA, GEORGIA

A ONE MAN TRUCK
For Handling Boxes, Barrels, Kegs, Bales, Crates, Drums, Bags, Cases and Bundles.

"Sonoco"

"SONOCO"

Unfailing Uniformity

of accuracy and strength, plus an improved, and exclusive, "Sonoco" Surface, means that "Sonocones" are the answer to most Winding Room problems.

We want to extend our usefulness to your mill

Southern Novelty Co., Manufacturers
Hartsville, South Carolina

CONES

"Sonoco"

To Facilitate Production

KEYSTONE "PEERLESS"

SEAMLESS ROVING CANS

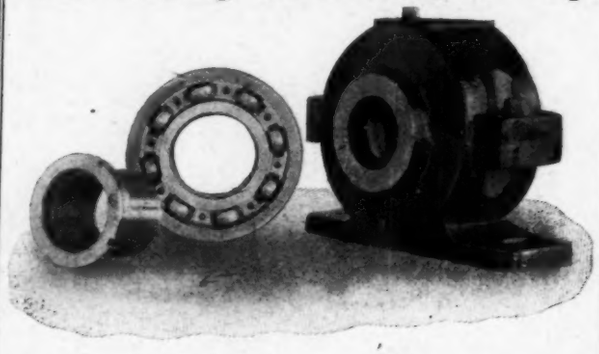
The lightest, strongest, longest-lived roving cans on the market.

No seams, no rough edges, no bolts or rivets. Your mill supply house can fill your order.

The full line of Keystone Holloware is shown in our booklet. Send for one.

Keystone Fibre Company
Box 142 Yorklyn, Delaware

The Bearing That Betters the Lap



Ball bearings on picker beaters save power, oil, time, labor, and material, and practically eliminate maintenance expense.

They permit absolutely exact and permanent adjustment of beaters, which means evener lap with a better selvedge.

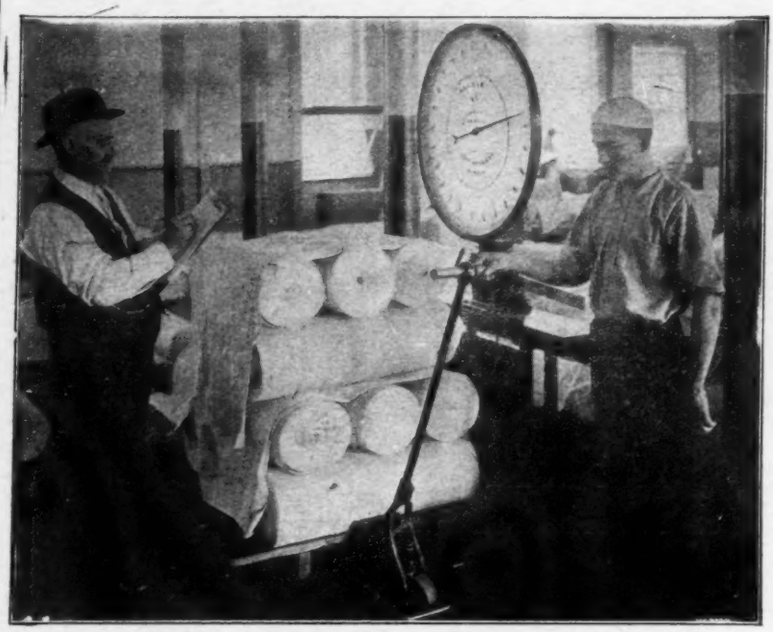
They keep all the oil in the box and off of the lap. They eliminate the shutdowns caused by hot boxes. They will pay for themselves in less than two years.

You either have them or need them. For information write to

Aldrich Machine Ball Works Bearings

Greenwood, South Carolina.

Automatic Weighing



This picture shows a Kron Automatic Scale, platform type, in a prominent Southern Textile Mill.

Save

TIME—LABOR—MONEY

by installing

"Load and Look"

Kron Scales

AUTOMATIC Made in U. S. SPRINGLESS

All Metal Construction

There's a Kron For Every Weighing Purpose

ALL TYPES—ANY CAPACITY—Dormant or Portable, Hanging Pan Types, Overhead Truck Scales, Suspension Crane Scales, etc.

Write for complete information.

American Kron Scale Co.

422 East 53rd St., New York

Branch Offices & Service Stations in Principal Cities

CANADIAN KRON SCALE CO., MONTREAL, CAN.

95% Saving

is being accomplished in one movement of goods by one of our patrons. This is important to you at this time when labor is scarce and your loads are heavy.

"The HOLYOKE" Transfer Truck

is the answer made by American inventiveness to the war-time needs of warehousemen.

Ask us to tell you about our various models and which one is best adapted to your needs. They are all strongly built for heavy service and sold under a liberal guarantee.

Write for Circular B-1

Holyoke Truck Co.

Main Office and Factory

119 Race St., HOLYOKE, MASS.

HOLYOKE TRUCK COMPANY EFFICIENCY QUALITY SERVICE HOLYOKE MASS

MODERNIZE YOUR INDOOR TRANSPORTATION

Obsolete methods in handling your indoor transportation are costing you money—it's a waste! Let the truck experts solve this problem for you. We have a truck for every business—for every purpose. There's a way to handle your indoor transportation better. Let us show you. No obligation to investigate.

CUT THIS OUT ☞

ATTACH TO YOUR LETTER HEAD AND MAIL. WE'LL SEND YOU CATALOG DESCRIBING A TRUCK FOR YOUR NEEDS

J. R. REGNAS & COMPANY
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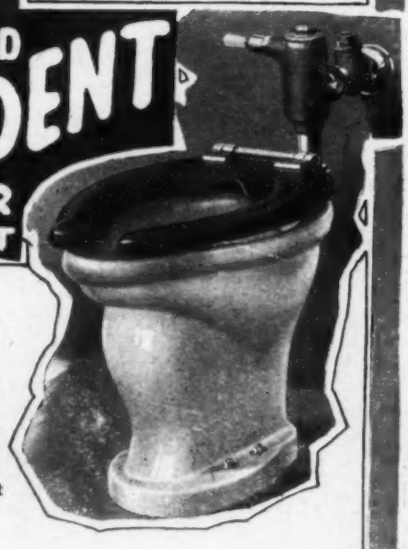
WON'T CLOG

THE IMPROVED TRIDENT

THE ideal Water Closet that insures correct sanitation. So constructed that it will not clog. It has proven its popularity in scores of mills and factories throughout the country.

THE IMPROVED TRIDENT WATER CLOSET



Write for Illustrated folder showing this Iproved Water Closet in detail.

The Trident has an improved extra large throat-way and direct drop to the outlet. It has no horizontal shelf in the bottom part of the outlet—the main cause of clogging in most closets.

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Efficient Conveying and Storage Equipment Will Cut Down Your Labor Costs.

Several years of specializing on conveying and storage equipment for cotton mills enable us to solve your problems in an intelligent way, to suggest the most efficient equipment for the work you have to do.

Without obligation on your part, one of our representatives will be glad to call and tell you frankly what our equipment can do for you.

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"Serving Southern Concerns"

J. D. COLLINS,
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Beckley Perforating Co.
14 North Ave.
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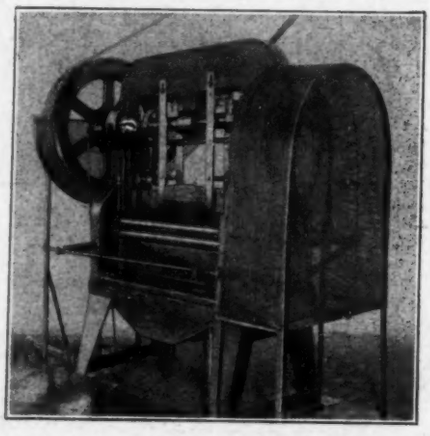

STEEL surfacing for sand rolls, Drying machines and ovens, Copper and brass centrifugal liners, Sheet steel for machinery guards, Steel vats, Kettles and Tanks, electrically welded.

SOUTHERN AGENTS
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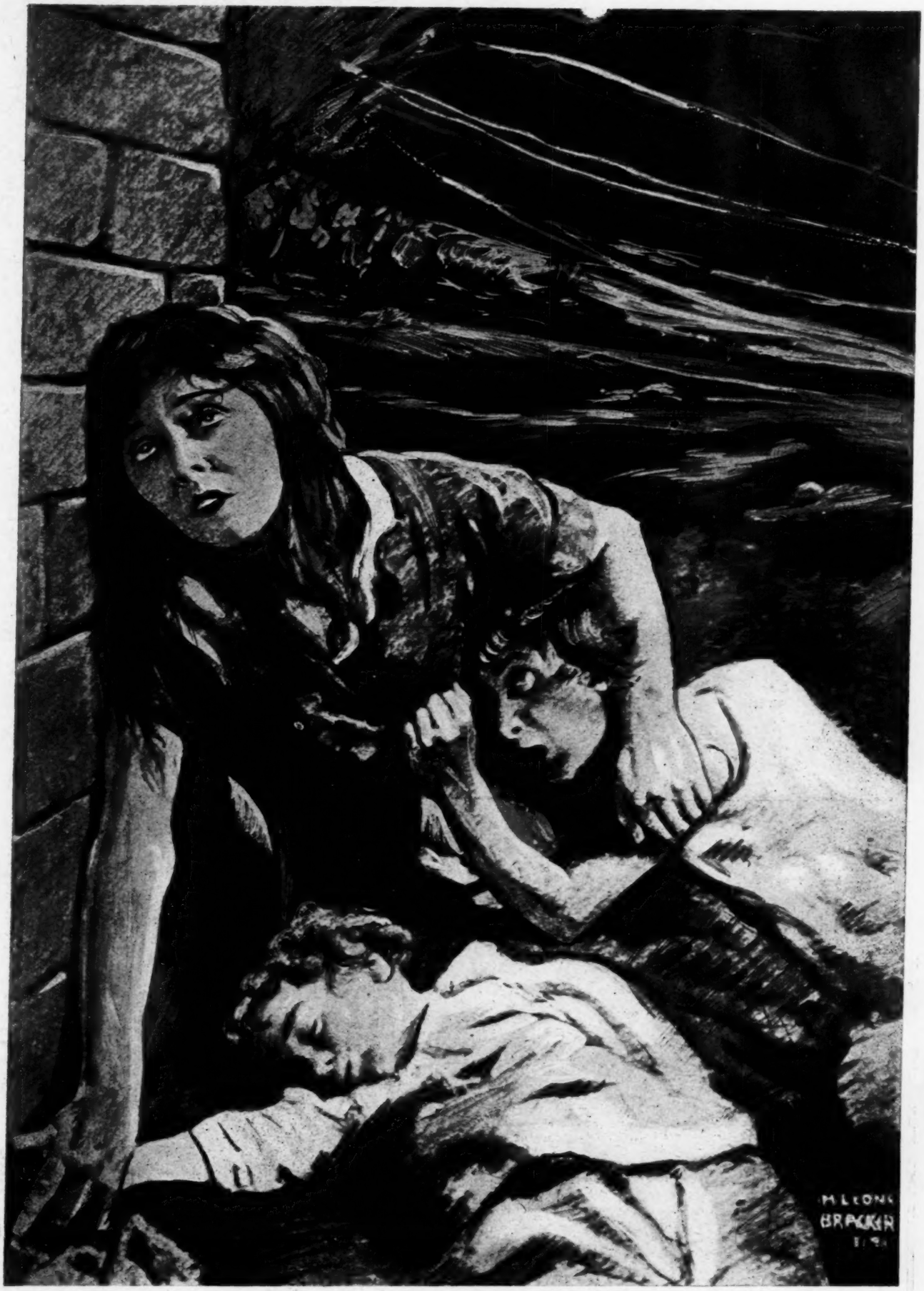

"Hunger Knows No Armistice!"

This picture, painted especially for the Near East Relief by M. Leone Bracker, vividly portrays what words fail to express. 800,000 destitute Armenians will starve unless food is provided for them until next year's harvest. All contributions should be addressed to THE NEA R EAST RELIEF, 1 Madison Ave., New York.

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A white coating designed expressly for the walls and ceilings of factories and mills. Made in Flat, Semi-Gloss and Gloss Finish, will—

SAVE DAYLIGHT,
SAVE EYESIGHT AND
INCREASE DIVIDENDS, DUE TO BETTER WORKING CONDITIONS

Manufactured Only by

The Bay Staters

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LABOR UNREST---Solve the Problem

by providing comfortable homes for your workmen. Healthy workers are contented. Contentment means increased and sustained production. Your employes, if furnished city conveniences and decent living conditions for themselves and their families, are going to remain loyal to you. They'll turn a deaf ear to the agitator.

Kaustine Toilet Systems

will solve your problem if you have no water nor sewer connections. They are approved by health authorities everywhere. You can install the Kaustine System and eliminate the disease-breeding housefly and the outhouse nuisance.

HOW THE SYSTEM WORKS

Sewage falls into Kaustine tank, where it is disinfected and deodorized by Kaustine, a powerful chemical. Then the contents of tank are flushed into leaching pool by drain valve. No bailing—no pumping.
The bowl is thoroughly ventilated by strong air currents drawn through pipe to roof or chimney. Kaustine Tanks and all metal parts are constructed of ARMCO (the pure) Ingot Iron, are specially treated and are absolutely air-tight.

Our sanitary engineers will advise how you can install Kaustine at a low cost. Write for the Kaustine catalog.

Send for literature on the construction, operation and application of the Hydro-Kaustine Septic Tanks.

HYDRO-KAUSTINE (Enameled Iron) SEPTIC TANKS

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Frost Proof Closets

350,000 giving satisfaction. Save Water; Require no Pit; Simple in the extreme. The most durable water closet made. In service winter and summer.

No. 1

- Enameled roll flushing rim bowls.
- Heavy brass valves.
- Strong hardwood seat. Galvanized tank.
- Malleable seat castings will not break.
- Tested under hydraulic pressure before leaving factory.

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WILMINGTON
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Securing pressure for fire protection

QUINEBAUG LAKE, near Wauregan, Conn., supplies water for the mill and village of Wauregan Company. A small reservoir near the village, formerly stored the water. The pressure was too weak.

Lockwood, Greene & Co. have provided a generous delivery of water at high pressure. The pumping station at the lake raises water to a 300,000 gallon steel tank on a hill near the village. This gives a head of 250 feet—good pressure for houses, mill and fire fighting.

Taking the pipe line through swamps and under a stream; bringing current for pumps from high tension lines half a mile away—were incidents that are soon forgotten. Because we overcame the handicaps, Wauregan has a water supply suited to present needs, that can be expanded when necessary.

On request, we will send you our book "Building with Foresight" describing other work we have done.

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Because you wanted the floor to last as long as possible, of course. Concrete floors are the most lasting floors, to be sure, but they have a bad habit of cracking and chipping up. First, they begin to dust, then they begin to pit and get rough, next they begin to crack and finally big ruts and holes appear, which require constant patching and finally the laying of a new floor.

So why not make those concrete floors PERMANENT with

DUROLITH

A Liquid Chemical That Makes Concrete Floors Wear and Dust Proof

Durolith is a liquid chemical that penetrates down into the porous concrete—sets up a chemical action that hardens and solidifies the entire mass, rendering the concrete granite like, dust proof and wear proof.

Durolith is inexpensive to use and can be applied by anyone who knows how to mop a floor. It can be applied after working hours and the floor used the next morning.

Let us send you full information and prices. Use the coupon if you like.

The Excello Manufacturing Co.

1836 Euclid Ave.,
Cleveland, Ohio

COUPON

The Excello Mfg. Co., Cleveland, Ohio.

Gentlemen:—Please send me full information and quote prices on DUROLITH, the liquid chemical for concrete floors.

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A 1-16 inch coat will put any old roof in an element-proof, better-than-new condition

(Registered U. S. Patent Office)

Any old leaky roof, no matter what kind—gravel, composition, tin or iron—no matter what condition it's in—can be made better than new, weather-proof, crack-proof, decay-proof, with a 1/16 inch coating of GILSO-CEMENT.

GILSO-CEMENT is a combination of the best preservatives together with asbestos fibre and oils which thoroughly seals up every crack and crevice in a roof, forming a tough, elastic, one piece covering which withstands the worst weather conditions. Its non-drying oils thoroughly saturates the old basis, preventing its further decay.

GILSO-CEMENT will prove a good investment to you as well as it has to many other plants. Practically every railroad in the country has standardized it for old roof renewing purposes. Testimonials from hundreds of other manufacturing plants sent on request.

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This General Trade Mark

REG'D. TRADE MARK Tycos ROCHESTER, N.Y.

covers all indicating, recording and controlling instruments made by this company and is a synonym for standard apparatus—precision, reliability and permanence.

We invite, from all interested industrial managers, correspondence relating to our instruments and their uses.

Our stock models cover every usual industrial requirement, with very moderate outlay.

Taylor Instrument Companies
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There's a Tycos or Taylor Thermometer for Every Purpose

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STANLEY flexibility means increased power transmission

For quick delivery call on our Agents.

The unusual flexibility of Stanley Solid Woven Belting is the direct result of its construction—the special weave. It will pass over small pulleys and yet take enough of the total arc to obtain a real hold, while cutting down starting slippage.

Stretch is eliminated "once and for all" after the first few days of operation.

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LASTS INDEFINITELY

—for the wide expanse of industrial roof that must be covered effectively but at moderate cost—Withstands the extremes of weather—Resists the elements.

We have it or will make it to suit almost any specification, if your order warrants that.

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—prolongs the life of your old roof
—Made according to YOUR specification.

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Merit Plus Recognition

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Time, skill and effort must also proceed merit in order to obtain and maintain for merit the recognition it deserves.

The great number of large installations of Cresson-Morris Power Transmitting Machinery is proof of both the merit and the recognition of the merit that nearly three score years of skill and effort have endowed it with.

The cumulative knowledge of all this experience is always available to you in the recommendations of our engineers.

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Renew Your Broken Ones.

What's the use of spending your good money for new machines and machine parts, when those broken parts can be made as good as new by welding? It will pay you in more than one way to install a

Standard Welding and Cutting Machine

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We not only supply the machine, oxygen and supplies, but we send experts to your plant to teach your mechanic how to use it.

STANDARD SERVICE means that if you have a breakdown too large for your own mechanic, our experts are always ready to come to you.

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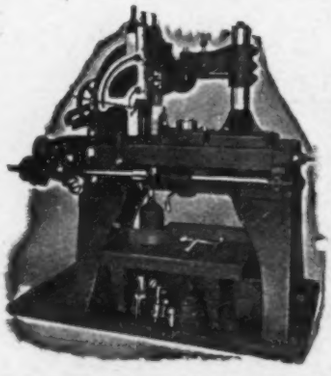

Full Automatic, Semi-Automatic and Hand Operated

Gear Cutting Machines

Especially adapted for use in Cotton Mills Hundreds now in use. Send for Special Circulars.

The D. E. Whiton Machine Co.,

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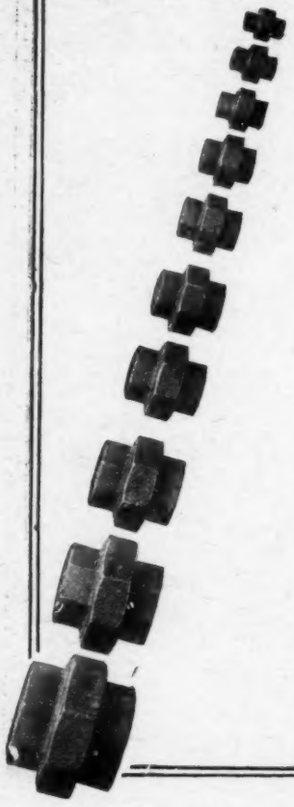

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Navy Octagon Unions

are made with brass to iron seats, eliminating the use of gaskets; they have heavy rings, strong shoulders, and liberal bearings.

These unions are strong enough to meet the most exacting conditions of service.

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Let us quote you on your requirements
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The Value of Wire Rope is not shown in the price per foot but in the work accomplished.

Evidence of the true worth of

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In elevators, mine and contractors' hoists, logging camps and at the Panama Canal, its record for strength and economy is unsurpassed.

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Parts shipped to us welded and returned promptly.

Or wire us, and one of our first-class machinists and practical welders will come to your plant and weld your job for you.

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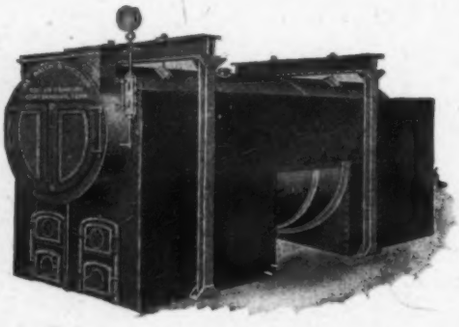
Set in Our Improved Steel Casings

SAVE 10% TO 25%

Of Your Fuel Bill.



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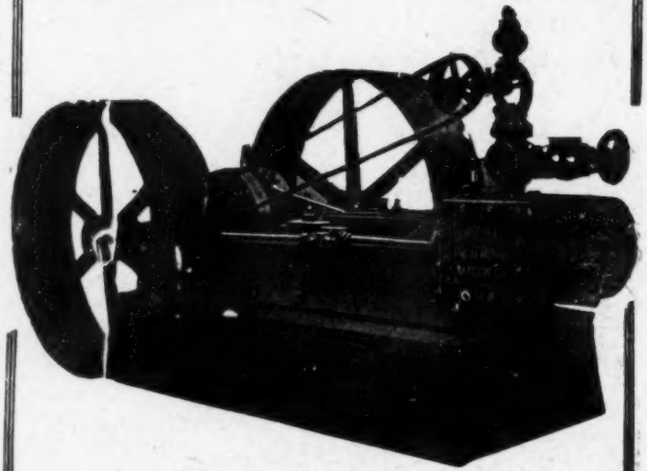

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High Pressure Return Tubular Boilers, High Grade Stationary Steam Engines, Tanks, Stacks, Stand Pipes.

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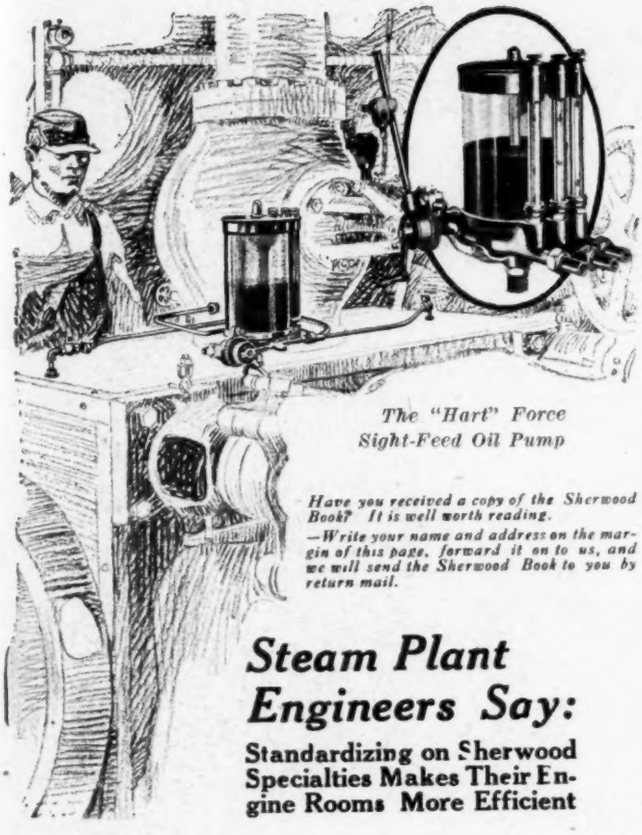

The "Hart" Force Sight-Feed Oil Pump

Have you received a copy of the Sherwood Book? It is well worth reading.
—Write your name and address on the margin of this page, forward it on to us, and we will send the Sherwood Book to you by return mail.

Steam Plant Engineers Say:

Standardizing on Sherwood Specialties Makes Their Engine Rooms More Efficient

Those engineers know and appreciate the many advantages of standardization in their engine rooms. They have seen that success in building ships, locomotives, automobiles, motor trucks, and the steam, gas, oil engines, which they operate, comes from standardization.

Moreover, those engineers standarize on the entire list of "Sherwood" Steam Specialties. They know that "Sherwood" Steam Specialties with the advantages of twenty-five years of successful manufacturing experience back of them—must possess merit.

Hence, those engineers are ardent users and boosters of the "Hart" Force Sight-Feed Oil Pump, "Eagle" Ejector, "Buffalo" Automatic Injector, "Buffalo" Glass Body Cylinder Oil Pump, "Favorite" Flue Scraper and Flue Blower—all members of the dependable and meritorious "Sherwood" Steam Specialty Family.

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Now, if "Sherwood" Steam Specialties have been successfully used by those engineers for more than twenty-five years, surely you are going to standardize on them and make your engine room a success.

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Brass Founders and Finishers

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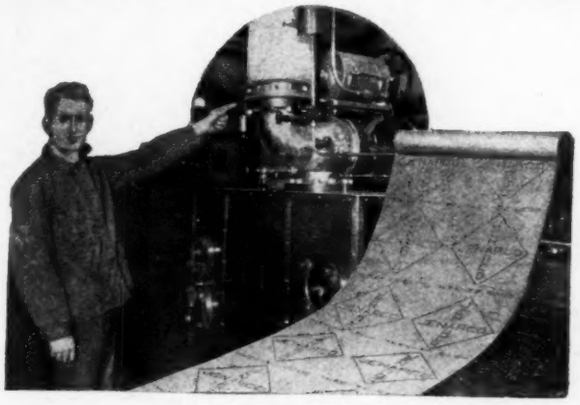
SHERWOOD
ENGINEERING-SPECIALTIES

Jenarco
Sheet Packing



There isn't an ounce of steam pressure lost on a Jenarco packed joint

"It holds tight under the most sever service and is equally dependable when used on hot or cold-water lines or for other liquids."

Jenarco is another Jenkins product that has proved its dependability by actual performance.

It is a high-grade vulcanized sheet-rubber packing, extremely tough and pliable, carefully compounded against deterioration.

It is easily applied and when once set forms a steam-proof, liquid-proof, air-proof joint.

Jenarco is not readily influenced by climatic conditions—heat, cold or dampness does not depreciate its strength and flexibility.

Jenarco is regularly made in 36-inch widths, put up in large rolls weighing approximately 225 pounds, or small rolls of 110, 50 or 25 pounds each.

All Jenkins mechanical rubber goods, including Jenarco, Jenkins 96', Pump Valves, Discs and Gasket Tubing, are guaranteed in every way.

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JENARCO Jenkins Packing

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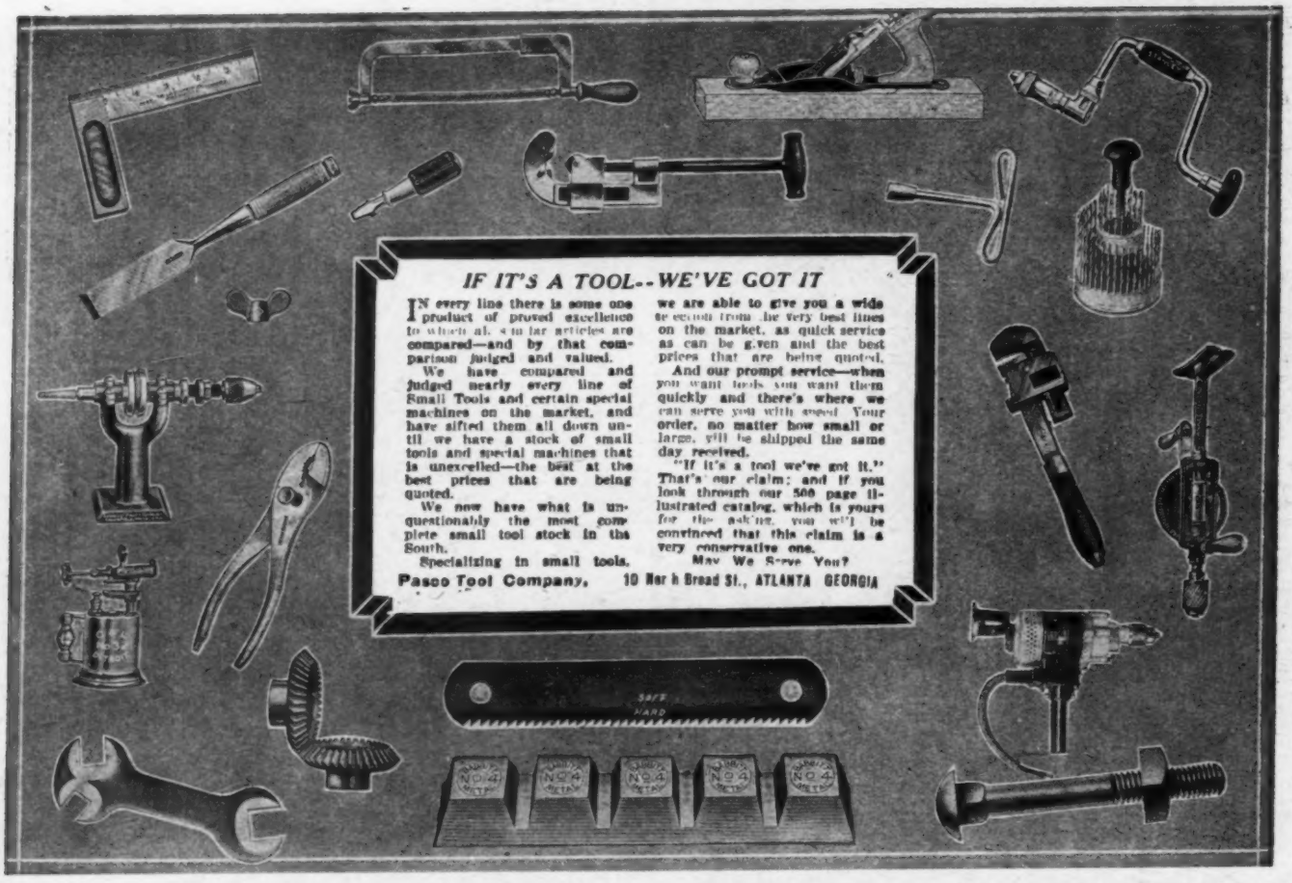
IF IT'S A TOOL--WE'VE GOT IT
IN every line there is some one product of proved excellence to which all similar articles are compared—and by that comparison judged and valued.
We have compared and judged nearly every line of Small Tools and certain special machines on the market, and have sifted them all down until we have a stock of small tools and special machines that is unexcelled—the best at the best prices that are being quoted.
We now have what is unquestionably the most complete small tool stock in the South.
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Everything for the Up-to-Date Machine Shop.

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TEXTILE AND GENERAL MILL SUPPLIES

with large stocks in our warehouse, enabling us to give the mills **prompt shipment** on all orders.

Our organization is composed of men, having many years of experience supplying the needs of the Southern textile mills. We are in a position to not only fill your orders promptly, but to have our representatives investigate the conditions in your mill, co-operate with you in solving your problems and recommending the equipment and supplies best suited to your particular requirements.

We invite the opportunity of demonstrating our service to you.

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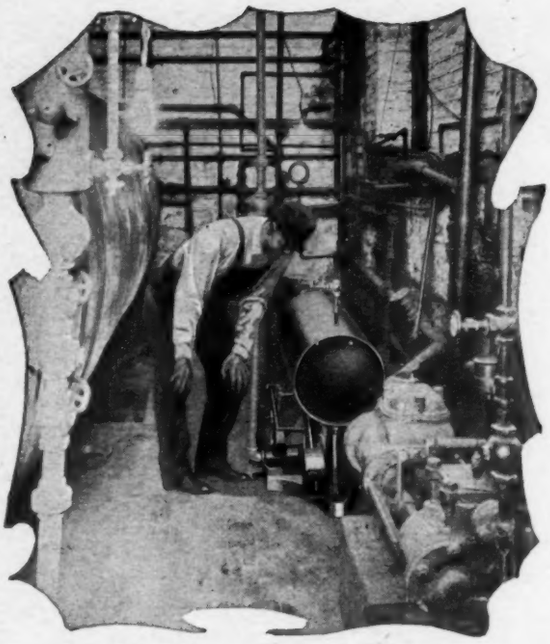

The above Morehead installation has solved the condensation problem in the plant of the Buffalo Cereal Company

"Here's Our Receipt For 20 Per Cent Of Our Coal Bill"

Hundreds of Morehead Systems are saving more than 20 per cent on fuel bills.

Often the Morehead System reduces fuel consumption more than 50 per cent.

Yet the coal saving is not the only advantage the Morehead System offers.

It keeps steam lines, steam heated machinery, coils and dr'ers free from condensation and returns the boiling hot water direct to the boilers ready to burst into steam.

Let us tell you what the Morehead System will do for you.

We'll gladly refer you to plants—similar to your own—where the Morehead System has speeded up production and at the same time effected a fuel saving.

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Morehead Manufacturing Co.

Detroit, Michigan

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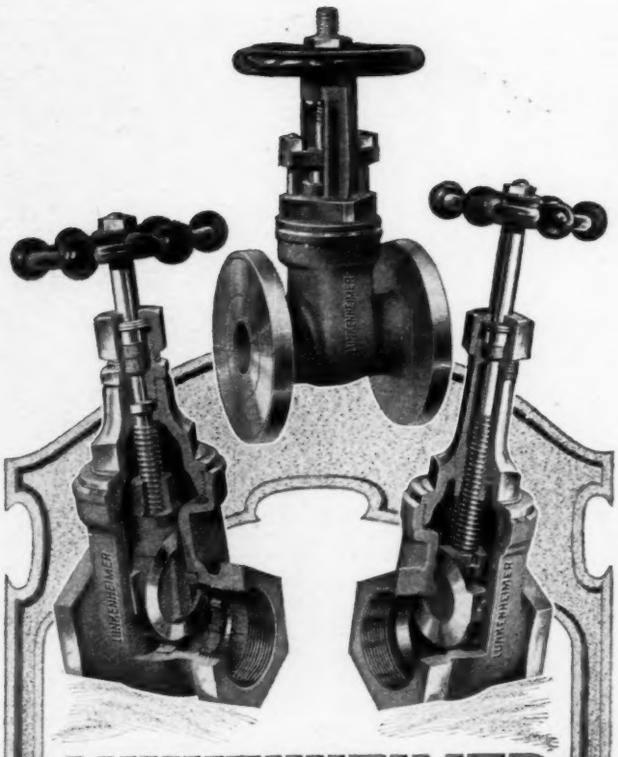
Positively Drains All Types of Steam Apparatus — Delivers Condensation And Feed Water to Boiler Under All Conditions at Maximum Temperature — Your Fuel Bills are Less

Morehead

"BACK-TO-BOILER-SYSTEM"



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have full straightway opening; are double seated and will take pressure from either end.

Bodies are heavy to resist pipe strains and the valves seat tight without undue pull on the handwheel.

The DOUBLE DISC type has a ball and socket bearing between the discs, making them self-adjusting and the discs are accurately guided by ribs in the body. Sizes ¼ to 3 inches, inside screw for working steam pressures up to 150 pounds.

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The material and workmanship are of that high order which characterizes all Lunkenheimer Products.

Your local dealer can furnish them; if not, write us. Write for Booklet No. 574-AK.

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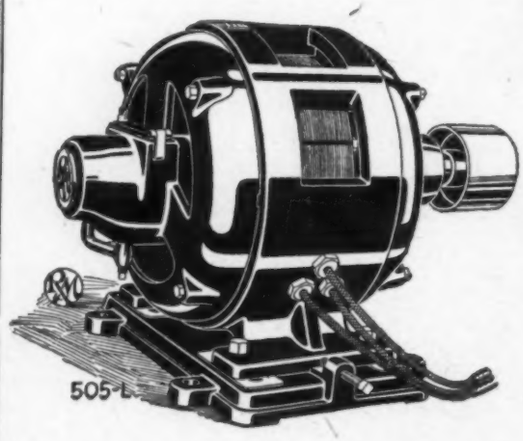

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LOCAL AND LONG DISTANCE
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When Electrical Supplies are Urgently needed it is

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That Counts

In this day of speedy production every hour means sixty "golden" minutes and every machine that fails in the performance of duty is a waste of time and energy.

When you are in need of Rubber Conduit Wire, Safety Switches, Wiring Devices, Fuses, Lamps and other electrical supplies, it is only a matter of a very few hours until we can place them in your hands.

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(See Storage Batteries).

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Chicago Watchman Clock Wks.

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(See Toilets.)

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(See Baling Presses.)

Cloth Cutters.
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Wildman Mfg. Co.

Cloth Room Machinery.
Butterworth, H. W. & Sons Co.
Firsching, J. A.
Saco-Lowell Shops.
Scott & Co., Henry L.
Southern Novelty Co.
Textile Finishing Machinery Co.
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Scott & Co., Henry L.

Cloth Tubes.
Southern Novelty Co.

Cloth Winders.
(See Winders)

Clutches (Friction.)
Carlyle-Johnson Mch. Co.
Cresson-Morris Co.
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Coal Tar Disinfectants.
(See Disinfectants.)

Cocks.
Lunkenheimer Co.

Cloors.
(See Dyestuffs and Chemicals.)

Color Pails.
(See Buckets—Mills.)

Comb Aprons.
(See Aprons.)

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(See Cotton Cloth Commission Merchants.)

Compresses (Cotton).
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Westinghouse Elec. & Mfg. Co.

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(See Architects and Engineers.)

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(See Electrical Engineers.)

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Portable Machinery Co.

Coolers.
(See Humidifying Apparatus.)

Coolers (Water).
(See Water Coolers.)

Cooling Towers.
(See Tanks and Towers.)

Copper Stamps and Stencils.
(See Stamps, Stencils, Etc.)

Cordage Machinery.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Textile Finishing Machinery Co. The.
Seeger Machine Tool Co.

Corrugated Bars.
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(See Brokers.)

Cotton Mill Machinery and Supplies.
Barber-Colman Co.
Brown Co., David.
Butterworth & Sons, H. W.
Carpenter Co., Geo. B.
Cocker Mch. & Foundry Co.
Crymes Mchry. & Supply Co.
Crompton & Knowles Loom Wks.
Delahunty Dyeing Machine Co.
Draper Corporation.
Firsching, J. A.
Fletcher Works.
Greenville Spool & Mfg. Co.
Howard & Bullough.
Jones Mchry. Corp.
Mill Supply Co. of Greenville.
Phila. Drying Mchy. Co.
Phila. Textile Machy. Co.
Sargent's Sons, Corp., C. G.
Saco-Lowell Shops.
Schaum & Uhlinger.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Stafford Co.
Steel Heddle Mfg. Co.
Terrell Machine Co.
Textile Finishing Machinery Co.
Whitin Machine Works.
Whittinsville Spinning Ring Co.

Cotton Tape Loom.
Fletcher Works.
Schaum & Uhlinger.

Cotton Yarn Mills.
(See Yarn Manufacturers.)

Coupling (Rope).
Hunt Co., C. W.

Counters (Revolution, Hank, Pick, Etc).
Veeder Mfg. Co.

Cranes (Locomotive).
Link-Belt Company.

Crayons.
American Crayon Co.
Dixon Crucible Co., Jos.
Lovingood Co.
Lowell Crayon Co.
Regnas & Co., J. R.

Crushing Machinery.
Allis-Chalmers Mfg. Co.

Cutters (Cloth).
(See Cloth Cuters.)

Cutters (Thread)
(See Thread Cutters.)

Dehumidifying.
Sturtevant Co., B. F.

Dial Scales.
American Kron Scale Co.

Dictaphones.
Dictaphone Co.

Dies (Steel).
(See Stamps, Stencils, Etc.)

Disinfectants.
Barrett Co., The

Dobby Chains.
Crompton & Knowles Loom Wks.
Whitin Machine Works.

Doffing Boxes (Mill).
(See Boxes—Mill.)

Door Closers and Checks.
Richards-Wilcox Mfg. Co.

Door Hangers.
Richards-Wilcox Mfg. Co.

Door Mats (Steel).
Acme Steel Goods Co.
Tagliabue Mfg. Co., C. J.
Lovingood Co.
Regnas & Co., J. R.

Draft Gauges and Thermometers.
Taylor Instrument Co.

Drawing Frames.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

Drills (Electric).
(See Electric Machinery.)

Drinking Fountains.
(See Fountains—Drinking.)

Drop Wires.
Steel Heddle Mfg. Co.

Drying Apparatus.
New York Blower Co.
Sturtevant Co., B. F.

Drying Forms (Hosiery).
Paramount Hosiery Form Drying Co.
Pearson, Jos. T.

Drying Machinery.
American Laundry Mchry. Co.
Butterworth, H. W. & Sons Co.
Phila. Textile Mchry. Co.
Sargent's Sons Corp., C. G.
Textile Finishing Machinery Co., The

Dust Collectors.
(See Blowers and Blowing Systems.)

Dusting Machinery.
Schofield Co., Wm.
Smith & Furbush Mach. Co.

Dyers, Bleachers and Finishers.
American Processing Co.

Dyeing, Bleaching, Finishing and Printing Machinery.
American Laundry Mchry. Co.
Butterworth & Sons Co., H. W.
Cocker Mch. & Foundry Co.
Electro Bleaching Gas Co.
Firsching, J. A.
Fletcher Works.
Permutit Co.
Phila. Drying Machinery Co.
Phila. Textile Machy. Co.
Refinite Co.
Reliance Machine Works.
Rome Mch. & Fdry. Co.
Schaum & Uhlinger.
Textile Finishing Machinery Co., The
Tolhurst Machine Works.

Dye Sticks.
Phila. Drying Machinery Co.

Dyestuffs and Chemicals.
Aniline Dyes & Chemicals, Inc.
Arabol Mfg. Co.
Arnold, Hoffman & Co.
Atlantic Dyestuff Co.
Barrett Co.
Borne, Scrymser Co.
Bosson & Lane.
Dow Chemical Co.
Du Pont de Nemours & Co., E. I.
Electro Bleaching Gas Co.
Grasselli Chemical Co.
Hemingway Inc., Frank
Kali Mfg. Co.
Klipstein & Co., A.
Lewis, John D.
Metz & Co., H. A.
National Aniline & Chemical Co.
Newport Chemical Works, Inc.
Rossler & Hasslacher Chemical Co.
Sherwin-Williams Co.
Surpass Chemical Co.
United Chemical Products Corp.
Wolf & Co., Jacques

Ejectors.
Sherwood Mfg. Co.

Electric Dynamos and Motors.
(See Motors and Generators.)

Electric Fans.
(See Fans—Electric.)

Electric Lamps.
(See Lamps.)

Electric Lamp Guards.
Flexible Steel Lacing Co.

Electric Signs.
Federal Electric Co.

Electric Sirens.
Federal Electric Co.

Electrical Engineers and Contractors.
Huntington & Guerry, Inc.
Imperial Electric Co.

Electrical Machinery and Supplies.
Allis-Chalmers Mfg. Co.
Benjamin Electric Co.
Bryan Electric Co.
Carpenter Co., Geo. B.
Carter Electric Co.
Crymes Mchry. & Supply Co.
Cutter Co., Geo.
Economy Fuse & Mfg. Co.
Federal Electric Co.
Imperial Electric Co.
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Seeger Machine Tool Co.
Southern Textile Mchry. Co.
Walraven Co., The
Walsh & Weidner Boiler Co.
Westinghouse Electric & Mfg. Co.
Co.

Electrical Repairing (all kinds).
Jones Mchry. Corp.

Electric Tractors and Trucks.
(See Tractors & Trucks—Elec.)

Elevators.
Collins, J. D.
Hunt Co., C. W.
Link-Belt Company.
Seeger Machine Tool Co.

Enamel—Mill White.
(See Paint—Mill White.)

Engineers (Mill).
(See Architects.)

Engines—Oil, Gas and Gasoline.
Carpenter Co., Geo. B.
Crymes Mchry. & Supply Co.
Seeger Machine Tool Co.

Engines—Steam.
Allis-Chalmers Mfg. Co.
Carpenter Co., Geo. B.
Crymes Mchry. & Supply Co.
Jones Mchry. Corp.
Lombard Iron Works & Supply Co.
Schofield's Sons Co., J. S.
Toomey, Frank
Walsh & Weidner Boiler Co.

Engine Appliances—Oil and Steam.
Carpenter Co., Geo. B.
Crymes Mchry. & Supply Co.
Jenkins Bros.
Crane Co.
Jones Mchry. Corp.
Lunkenheimer Co.
Sherwood Mfg. Co.

Engine Room Supplies.
Carpenter Co., Geo. B.
Crane Co.
Crymes Mchry. & Supply Co.
Goodyear Tire & Rubber Co.
International Eng. Wks.
Jenkins Bros.
Jones Mchry. Corp.
Lunkenheimer Co.
Graton & Knight Mfg. Co.
Sherwood Mfg. Co.

Exporters (Cotton).
(See Brokers.)

Extractors—Hydro.
American Laundry Mchry. Co.
Fletcher Works.
Schaum & Uhlinger.
Tolhurst Machine Works.

Fans—Electric.
Allis-Chalmers Mfg. Co.
American Blower Co.
Benjamin Electric Co.
Bryan Electric Co.
Carter Electric Co.
General Elec. Co.
Howard & Morse.
Westinghouse Elec. & Mfg. Co.

Fans—Conveying, Power and Exhaust.
(See Blowers and Blowing Systems.)

Feed Water Purifiers.
(See Water Softeners.)

Felting Machinery.
Smith & Furbush Mch. Co.

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American Cast Iron Pipe Co.
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Belmont Iron Works.
Cyclone Fence Co.

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Leatheroid Sales Co.
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(See Water Softening.)

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(See Dyers, Bleachers and Finishers.)

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Newport Chemical Works, Inc.
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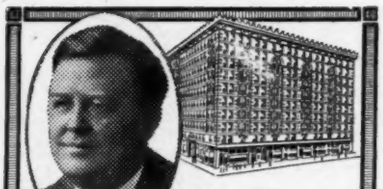

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Co.
Sherwin-Williams Co.
United Chemical Products Corp.
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Wolf & Co., Jacques
Fire Doors.
Richards-Wilcox Mfg. Co.
Fire Door Hardware (Automatic).
Richards-Wilcox Mfg. Co.
Fire Escapes (Spiral).
Collins, J. D.
Fire Hose.
(See Paint—Fireproof.)
Fire Protecting Paint.
(See Hose—Fire.)
First Aid Room Equipment.
(See Hospital Equipment.)
Flooring (Hardwood).
Nashville Hardwood Flooring Co.
Floor Scrubbing Machine.
American Scrubbing Machine Co.
Fluted Rolls.
Howard & Bullough.
Saco-Lowell Shops.
Schofield's Sons Co., J. S.
Smith & Furbush Machine Co.
Southern Spindle & Flyer Co.
Whitin Machine Works.
Flyers.
Howard & Bullough.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.
Fountains (Drinking).
Crane Co.
Mott-Southern Co.
Rundle-Spence Mfg. Co.
Southern States Supply Co.
Friction Clutches.
(See Clutches—Friction.)
Fuses.
(See Elec. Mchy. and Supplies.)
Garage Door Hardware.
Richards-Wilcox Mfg. Co.
Garnett Machines.
Roy Son Co., B. S.
Smith & Furbush Mach. Co.
Gas Engines.
(See Engines—Gas.)
Gasoline Tanks and Pumps.
Wayne Oil Tank & Pump Co.
Gaskets.
Graton & Knight Mfg. Co.
Gauge Cocks.
Lunkenheimer Co.
Gauges—Draft.
Taylor Instrument Co.
Gauges—Mercury Column Vacuum.
Taylor Instrument Co.
Gauges—Oil.
Lunkenheimer Co.
Gauges—Water.
Lunkenheimer Co.
Gears—Silent.
General Electric Co.
Link-Belt Company.
Morse Chain Co.
Gear Cutters.
Cresson-Morris Co.
Whitin Mch. Co., D. E.
Gear Pullers.
Greb Co., Inc.
Generators—Electric.
(See Motors and Generators.)
Graphite—Products.
Dixon Crucible Co., Jos.
Grates (Boiler).
International Eng. Works.
Lombard Fdy & Mch. Co.
McNaughton Mfg. Co.
Grease.
(See Lubricants.)
Grease Cups.
(See Lubricators.)
Grindstones.
Richards-Wilcox Mfg. Co.
Grinders—Card. Cylinder Roll, Napper and Garnett.
(See Card Grinding Machinery.)
Guards (Elec. Lamp.)
Flexible Steel Lacing Co.
Guides (Thread).
Mitchell-Bissell Co.
Palmer Co., I. E.
Gums.
(See Finishing and Sizing Materials.)
Hangers.
(See Shafting and Hangers.)
Harness—Loom.
American Supply Co.
Crompton & Knowles Loom Wks.
Emmons Loom Harness Co.
Garland Mfg. Co.
Electro Bleaching Gas Co.
Heating and Ventilating Apparatus.
(See Ventilating Apparatus.)
Heddles.
Crompton & Knowles Loom Wks.
Draper Corporation.
Steel Heddle Mfg. Co.
Heddle Frames.
Crompton & Knowles Loom Wks.
Steel Heddle Mfg. Co.
Hinges & Butts.
McKinney Mfg. Co.
Hoists.
Link-Belt Company.
Morse Chain Co.
Pasco Tool Co.
Seeger Machine Tool Co.
Hose—Fire.
Collins, J. D.
Goodyear Tire & Rubber Co.
Hosiery Dyeing Machinery.
Cocker Mch. & Fdry. Co.
Hosiery Finishing Boards.
(See Boards.)
Hosiery Forms.
(See Drying Forms.)
Hosiery Yarns.
(See Yarn Manufacturers.)
Hospital Equipment.
Thomas Co., F. H.
Wright Co.
Hotels.
Marquette.
Martinique.
Sinton.
Tuller.
Houses (Ready-Made).
(See Bungalows.)
Humidifying Apparatus.
American Blower Co.
Carrier Eng. Corp.
New York Blower Co.
Parks-Cramer Co.
Sturtevant Co., B. F.
Hydraulic Turbines.
(See Turbines—Steam.)
Hydro Extractors.
(See Extractors.)
Hydrometers.
Taylor Instrument Co.
Hygrometers.
Taylor Instrument Co.
Hygrodeiks.
Taylor Instrument Co.
Indicating and Recording Instruments.
Taylor Instrument Co.
Tagliabue Mfg. Co., C. J.
Indigo.
(See Dyestuffs and Chemicals.)
Injectors.
Lunkenheimer Co.
Sherwood Mfg. Co.
Insurance.
Miller Indemnity Underwriters.
Ink—Stencil and Marking.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.
Lovingood Co.
National Marking Machine Co.
Regnas & Co., J. R.
Iron Work—Ornamental.
American Cast Iron Pipe Co.
Anchor Post Iron Works.
Cyclone Fence Co.
Dufur & Co.
Lombard Iron Works & Supply Co.
Jacks.
Paulus, Chas. B.
Jacquards.
Crompton & Knowles Loom Wks.
Jute Bagging Machines.
Smith & Furbush Mach. Co.
Kettles—Size.
(See Size Kettles.)
Kettles—Soda.
Lombard Iron Works & Sup. Co.
Kiers.
(See Bleaching Kiers.)
Knit Goods.
(See Cotton Cloth Commission Merchants and Dealers.)
Knit Goods Washers.
(See Washers—Cloth.)
Knitting Machinery and Supplies.
Adams Co., Geo. H.
Boss Knitting Mach. Works.
Brinton Co., H.
General Machine Works.
Hemphill Mfg. Co.
Nye & Tredick Co.
Scott & Williams.
Smith & Furbush Mach. Co.
Wildman Mfg. Co.
Lamps—Incandescent and Arc.
Benjamin Electric Co.
Boston Economy Lamp Div.
Bryan Electric Co.
Carter Electric Co.
Jones Mchry. Corp.
Crymes Mchry. & Supply Co.
General Electric Co.
Westinghouse Lamp Co.
Lamp Guards (Key Locking).
Flexible Steel Lacing Co.
Lamp Reflectors.
Benjamin Electric Co.
Bryan Electric Co.
Carter Elec. Co.
Cutter Co., Geo.
Ivanhoe-Regent Works.
Luminous Specialty Co.
Landscape Architects.
(See Village Architects.)
Lappers.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Whitin Machine Works.
Latch Needles.
Paulus, Chas. B.
Laundry Machinery.
American Laundry Mchry. Co.
Fletcher Works.
Schaum & Uhlinger.
Tolhurst Machine Wks.
Lavatories.
Crane Co.
Mott Southern Co.
Leather Belting.
(See Belting.)
Leather Specialties.
American Supply Co.
Graton & Knight Mfg. Co.
Jewell Belting Co.
Ladew & Co., Inc. Edw. R.
Williams & Sons, I. B.
Linen Yarns.
(See Yarns—Linen.)
Link Belting.
(See Belting—Linen.)
Linters.
(See Waste Dealers.)
Liquid Chlorine.
(See Chlorine.)
Loaders—Waste and Trucks.
Link-Belt Company.
Locks and Latches.
Richards-Wilcox Mfg. Co.
Lockers (Metal).
Collins, J. D.
Medart Mfg. Co., Fred.
Logwood Extract.
(See Dyestuffs and Chemicals.)
Looms.
Crompton & Knowles Loom Wks.
Draper Corporation.
Fletcher Works.
Jones Mchry. Corp.
Saco-Lowell Shops.
Schaum & Uhlinger.
Schofield, Wm. & Co.
Stafford Co., The
Whitin Machine Works.
Loom Attachments (Auto).
Draper Corp.
Lumber (See Building Material).
Lubricants.
Dixon, Jos., Crucible Co.
Kellogg & Co., E. H.
N. Y. & N. J. Lubricant Co.
Swan & Finch Co.
Texas Co.
Lubricant, Tanks and Pump.
Wayne Oil Tank & Pump Co.
Lubricators.
Lunkenheimer Co.
N. Y. & N. J. Lubricant Co.
Sherwood Mfg. Co.
Lug Straps.
(See Straps—Lug.)
Lunch Room Equipment.
(See Restaurant.)
Machine Tools.
(See Tools.)
Marking (Dry Transfer).
Kaumagraph Co.
Marking Pots, Stencils, Inks, Etc.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.
Lovingood Co.
National Marking Machine Co.
Regnas & Co., J. R.
Marking Machines.
National Marking Machine Co.
Mercerized Yarns.
(See Yarns Mercerized.)
Mercerizing Machinery.
Butterworth, H. W. & Sons Co.
Textile Finishing Machinery Co.
Metal Ceilings, Etc.
Lupton's Sons Co., David
Metals (Perforated).
(See Screens and Sieves.)
Metal Workers—Sheet.
Lombard Iron Works & Supply Co.
Meters—Flow, Air, Gas, Electric, Steam, Etc.
Allis-Chalmers Mfg. Co.
Benjamin Electric Co.
Bryan Electric Co.
Carter Electric Co.
General Electric Co.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.
Westinghouse Elec. & Mfg. Co
Meters (Revolution).
Taylor Instrument Co.
Mill Baskets and Boxes.
(See Boxes—Mill.)
Mill Engineer.
(See Architects and Engineers.)
Mill Villages.
(See Villages.)
Mill Supplies (Misc.).
(See Supplies—Mill).
Mill White Paint.
(See Paint—Mill White.)
Monorail Conveying Systems.
Richards-Wilcox Mfg. Co.
Motors and Generators—Electric.
Allis-Chalmers Mfg. Co.
Benjamin Electric Co.
Bryan Electric Co.
Carter Electric Co.
Crymes Mchry. & Supply Co.
General Electric Co.
Imperial Electric Co.
Jones Mchry. Corp.
Seeger Machine Tool Co.
Walraven Co., The
Westinghouse Elec. & Mfg. Co.
Moving Picture Machines.
Lucas Theatre Supply Co.
Southern Theatre Equip. Co.
Mule Stands.
Transmission Ball Bearing Co.
Nails—Cement Coated.
Lovingood Co.
Regnas Co., J. R.
Nappers.
Roy & Son Co., B. S.
Needles—Latch.
Paulus, Chas. B.
Oils—Finishing
(See Finishing and Sizing Materials.)
Oils—Lubricating.
(See Lubricants.)
Oil Cups.
(See Lubricators.)
Oil Paper.
Bradley Mfg. Co., A. J.
Oil Tanks & Pumps.
Wayne Oil Tank & Pump Co.
Oiling Devices.
(See Lubricators.)
Inc.
Openers for Cotton, Wool, Waste Etc.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Works.
Oxidizing Machinery.
Phila. Drying Machinery Co.
Oxygen.
Bird Wilcox Co.
Commercial Acetylene Supply Co.
Linde Air Products Co.
Packings.
Goodyear Tire & Rubber Co.
Graton & Knight Mfg. Co.
Jenkins Bros.
Paint.
Atlanta Gas Light Co.
Barrett Co., The
Chaffee, Thos. K.
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Hurst Co.
Sherwin-Williams Co.
Peaslee-Gaulbert Co., Inc.
Vortex Mfg. Co.
Wadsworth, Howland & Co.
Paint—Mill White.
Chaffee, Thos. K.
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Excello Mfg. Co.
Hurst Co.
Peaslee-Gaulbert Co., Inc.
Sherwin-Williams Co.
Vortex Mfg. Co.
Wadsworth, Howland & Co.
Paper.
Bradley Mfg. Co., A. J.
Perforated Metal.
(See Screens and Sieves.)
Peroxides.
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Dictaphone Co.
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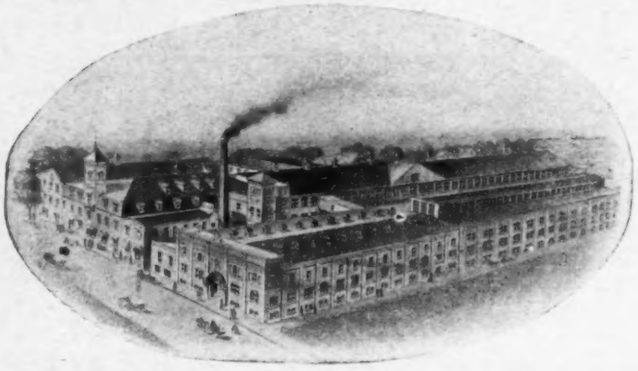

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May we go into the subject with you?

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BUYERS' INDEX—Continued.

Pickers—Leather.
Garland Mfg. Co.

Picker Sticks.
Garland Mfg. Co

Picking Machinery.
Howard & Bullough, Am. Machine Co.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Pipe Fittings.
Crane Co.
Lunkenheimer Co.

Pipe Threading & Cutting Machines.
Seeger Machine Tool Co.
Walraven Co., The

Playground Equipment.
American Playground Device Co.
Menart Mfg Co., Fred.

Power Transmission.
Aldrich Mch. Wks.
Allis-Chalmers Mfg. Co.
American Pulley Co.
Carlyle-Johnson Mch. Co.
Carpenter Co., Geo. B.
Cresson-Morris Co.
Crymes Mchry. & Supply Co.
Dodge Sales & Eng. Co.
General Electric Co.
Goodyear Tire & Rubber Co.
Graton & Knight Mfg. Co.
Hyatt Roller Bearing Co.
Jewell Belting Co.
Jones Mchry. Corp.
Kelly Co., Henry C.
Ladew & Co., Inc., Edw. R.
Link-Belt Company.
Morse Chain Co.
New Departure Mfg. Co.
S K F Industries.
Seeger Machine Tool Co.
Stanley Belting Corp.
U. S. Ball Bearing Co.
Valley Iron Works.
Walraven Co., The
Westinghouse Elec. & Mfg. Co.
Williams & Sons, I. B.

Presses.
American Laundry Machnry. Co.
Bridge & Co., Ltd., David
Butterworth & Sons Co., H. W.
Economy Baler Co.
Lovingood Co.
Phila. Drying Machine Co.
Reliance Machine Works.
Seeger Machine Tool Co.
Smith & Furbush Mch. Co.
Textile Finishing Machinery Co., The

Pulleys.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Link-Belt Company.
Seeger Machine Tool Co.
Valley Iron Works.
Walraven Co., The

Pulley Covering.
Goodyear Tire & Rubber Co.
Stanley Belting Corp.
Williams & Sons, I. B.

Pumps.
Allis-Chalmers Mfg. Co.
Jones Mchry. Corp.
Seeger Machine Tool Co.
Textile Finishing Machinery Co.
Walsh & Weidner Boiler Co., The
Toomey, Frank
Westinghouse Elec. & Mfg. Co.

Pump Oil).
Wayne Oil Tank &Pump Co.

Pump Valves.
(See Valve Discs.)

Psychrometers (Sling).
Taylor Instrument Co.

Pyrometers.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Quill Cleaning Machines.
Terrell Mch. Co.

Railings.
Dufur & Co.

Recording Instruments.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Reeds.
American Supply Co.
Emmons Loom Harness Co.

Reels.
Cocker Mch. & Fdry. Co.
Crompton & Kowles Loom Wks.
Draper Corporation.
Saco-Lowell Shops.
Schofield, Wm. Co.
Whitin Machine Works.

Reflectors (Lamp).
Benjamin Electric Co.
Bryan Electric Co.
Carter Elec. Co.
Cutter Co., Geo.
Ivanhoe-Regent Works.

Refrigerating Machines.
Southern States Supply Co.

Regulators—Pressure.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Regulators—Temperature.
(See Temperature Controllers.)

Reinforcement Bars for Concrete.
Corrugated Bar Co.

Repairing (Electrical).
Jones Mchry. Corp.

Repairing (Textile Mchry, etc).
Bird-Wilcox Mfg. Co.
Chattanooga Brazing & Welding Co.
General Machine Works.
Southern Spindle & Flyer Co.

Restaurant Equipment.
Wright Co.

Rib Top Cutters.
General Machine Works.
Wildman Mfg. Co.

Ring Travelers—Steel and Bronze.
Whitinsville Spining Ring Co.
Whitin Machine Works.

Rings—Spinning.
(See Spinning Rings.)

Rocker Shaft Bearings.
(See Bearings.)

Rolls (Calender.)
Roy & Son Co., B. S.

Rolls—Steel.
Southern Spindle & Flyer Co.

Roofing.
Asphalt Roofing Co.
Atlanta Gas Light Co.
Barrett Co., The
High-Grade Mfg. Co.
Cortright Metal Roofing Co.
Peaslee-Gaulbert Co., Inc.
Vortex Mfg. Co.
Wadsworth, Howland & Co.

Roonng Felt and Pitch.
Atlanta Gas Light Co.

Roof and Cement Coating.
Asphalt Roofing Co.
Atlanta Gas Light Co.
Barrett Co.
Du Pont de Nemours & Co., E. I.
Excello Mfg. Co.
High-Grade Mfg. Co.
Hurst Co.
Peaslee-Gaulbert Co., Inc.
Sherwin-Williams Co.
Vortex Mfg. Co
Wadsworth, Howland & Co.

Rope—Transmission.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Hunt Co., C. W., Inc.
Kelly Co., Henry C.
Link-Belt Company.

Roving Cans and Trucks.
(See Cans—Roving.)

Roving Machinery.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

Rubber Stamps.
(See Stamps, Stencils, Etc.)

Rubber Goods.
Goodyear Tire & Rubber Co.

Sanitary Products.
Crane Co.
Kaustine Co.
Mott-Southern Co.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.
Wright Co.

Sash-Window—Steel.
Detroit Steel Products Co.
Lupton's Sons Co., David

Scales.
American Kron Scale Co.
Lovingood Co.
Standard Scale & Supply Co.
Torsion Balance Co.

Scale Preventer (Boiler).
(See Boiler Feed Water Purification.)

Screens & Sieves—Perforated.
Beckley Perforating Co.
Erdle Perforating Co.
Link-Belt Company.

Scrubbing Machine—Floor.
American Scrubbing Mch. Co.

Second Hand Machinery & Supplies.
Crymes Mchry. & Supply Co.
Jones Mchry. Corp.
DuPont Chemical Co.

Sewing Machines.
Merrow Machine Co., The
Textile Finishing Mchy. Co.
Wilcox & Gibbs Sewing Mach. Co.

Shades (Electric Lamp).
(See Reflectors).

Shafting & Hangers.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Link-Belt Co.
Seeger Machine Tool Co.
S K F Industries.
Valley Iron Works.
Walraven Co., The

Shears.
Roy & Son Co., B. S.

Shelving—Sectional Steel.
Collins, J. D.
Lupton's Sons Co., David
Medart Mfg. Co., Fred.

Shingles—Asphalt.
Barrett Co.

Shingles—Metal.
Cortright Metal Roofing Co.

Shipping Room Machinery and Supplies.
Acme Steel Goods Co.
American Kron Scale Co.
Atlanta Stamp & Stencil Works.
Baker, R. & L. Co.
Bradley Mfg. Co., A. J.
Carpenter Co., Geo. B.
Collins, J. D.
Cowan Truck Co.
Diamond State Fibre Co.
Elwell-Parker Elec. Co.
Holyoke Truck Co.
Hunt Co., C. W.
Industrial Truck Co.
Keystone Fibre Co.
Lane & Bro., W. T.
Leatheroid Sales Co.
Lovingood Co.
McKinney Mfg. Co.
Mercury Mfg. Co.
Regnas & Co., J. R.
Rogers Fibre Co.
Standard Scale & Supply Co.
Standard Fibre Co.
Seeger Machine Tool Co.
Signode System, Inc.
Torsion Balance Co.
Walraven Co., The

Shower Baths.
Crane Co.
Mott-Southern Co.

Shuttles.
Brown Co., David
Crompton & Knowles Loom Wks.
Draper Corporation.
Shambow Shuttle Co.

Signs (Electric).
Federal Electric Co.

Sinkers.
Paulus, Chas. B.

Singeing Machinery.
Butterworth & Sons Co., H. W.
Phila. Drying Machine Co.
Textile Finishing Machinery Co., The

Size Box Temperature Controller.
Tagliabue Mfg. Co., C. J.

Size Kettles.
Butterworth, H. W. & Sons Co.
Howard & Bullough, American Machine Co.
Lombard Iron Works & Sup. Co.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The

Sizing and Finishing Compounds.
(See Finishing & Sizing Materials.)

Skewers.
Brown Co., David
Greenville Spool & Mfg. Co.
Jordan Mfg. Co.

Skylights—Steel.
Lupton's Sons. Co., David

Slashers and Slasher Room Supplies.
Butterworth & Sons Co., H. W.
Cocker Mch. & Foundry Co.
Howard & Bullough.
Lovingood Co.
Mossberg Co., Frank
Regnas & Co., J. R.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The

Slasher Tape.
(See Tape—Slasher.)

Slate Asphalt Roofing.
Barrett Co.

Sliding Partition Hardware.
Richards-Wilcox Mfg. Co.

Slubbers.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

Soap—Textile.
Aniline Dyes & Chemicals, Inc.
Arnold, Hoffman &Co.
Dow Chemical Co.
Du Pont de Nemours & Co., E. I.
Electric Smelting & Alum. Co.
Grasselli Chemical Co.
Kali Mfg. Co.
Hemingway & Co., Frank
Kilpstein & Co., A.
Newport Chemical Works.
United Chemical Products Corp.
Warren Soap & Mfg. Co.
Wolf & Co., Jacques

Softeners—Cotton.
Aniline Dyes & Chemicals, Inc.
Arabol Mfg. Co.
Arnold, Hoffman & Co.
Atlantic Dyestuff Co.
Borne, Schrymser Co.
Bosson & Lane.
Dow Chemical Co.
Du Pont de Nemours & Co., E. I.
Grasselli Chemical Co.
Hemingway & Co., Frank
Kali Mfg. Co.
Klipstein & Co., A.
Newport Chemical Works.
Rossler & Hasslacher Chemical Co.
United Chemical Products Corp.
Wolf & Co., Jacques

Softeners—Water.
(See Water Softeners.)

Solderless Connectors (Frankel.)
Westinghouse Elec. & Mfg. Co.

Solvents.
(See Finishing.)

Spindles.
Allen Spindle Corp.
Draper Corporation.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Spindles—Ball Bearing.
Allen Spindle Corp.

Spinners.
Arlington Cotton Mills.
Arrow Mills, Inc.
Flint Mfg. Co.
Gray Mfg. Co.
Hunter Mg. & Comm. Co.
Myrtle Mills, Inc.
Parkdale Mills, Inc.

Spinning Frames.
American Machine Co., H. & B.
Crompton & Knowles Loom Wks.
Draper Corporation.
Fletcher Works.
Howard & Bullough.
Saco-Lowell Shops.
Schaum & Uhlinger.
Whitin Machine Works.

Spinning Rings.
Draper Corporation.
Howard & Bullough.
Whitin Machine Works.
Whitinsville Spinning Ring Co.
Greenville Spool & Mfg. Co.
Southern Novelty Co.
Whitin Machine Wks.
Whitinsville Spinning Ring Co.

Spinning Tape Specialists.
American Textile Banding Co. Inc.
Barber Mfg. Co.

Spinning Room Machinery and Supplies.

Spooling Machinery.
Draper Corporation.
Greenville Spool & Mfg. Co.
Saco-Lowell Shops.
Smith & Furbush Machine Co.
Whitin Machine Works.

Spools & Skewers.
Brown Co., David
Greenville Spool & Mfg. Co.

Sprayers for Boll Weevil.
Niagara Sprayer Co.

Sprinkler Tanks.
(See Tanks, Towers, Etc.)

Sprockets.
Link-Belt Company.
Morse Chain Co
Valley Iron Works.

Stamping (Dye Transfer System).
Kaumagraph Co.

Stamps, Stencils and Stencil Machines.
Atlanta Stamp & Stencil Works.
Bradley Mfg. Co., A. J.
Lovingood Co.
Regnas & Co., J. R.

Stand Pipes.
(See Tanks, Towers, Etc.)

Starch & Gums.
(See Finishing and Sizing Materials.)

Steam Engines.
(See Engines—Steam.)

Steam Hose.
(See Hose—Steam.)

Steam Pumps.
(See Pumps—Steam.)

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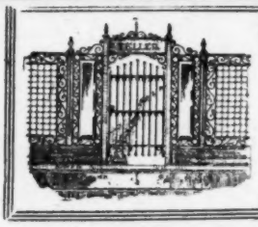

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(See Traps—Steam.)

Steel Doors, Window, Partition, Etc.
Lupton's Sons Co., David

Steel Lockers.
(See Lockers.)

Stencils & Stencil Papers.
(See Stamps and Stencils.)

Stencil Brushes.
(See Marking Pots and Brushes.)

Stencil Cutting Machines.
Atlanta Stamp & Stencil Works.
Bradley Mfg. Co., A. J.
Lovingood Co.
Regnas & Co., J. R.

Stop Motion.
Crompton & Knowles Loom Wks.
Draper Corporation.
Wildman Mfg. Co.

Storage Batteries.
Edison Storage Battery Co.

Storage Racks
(See Shelving)

Storage Tanks for Oil and Gasoline
Wayne Oil Tank & Pump Co.

Strapping.
(See Leather Specialties or Box Strapping.)

Supplies (General Mill).
Carpenter Co., Geo. B.
Crymes Mchry. & Supply Co.
Jones Mchry. Corp.
Mill Supply Co. of Greenville.
Regnas & Co., J. R.
Seeger Machine Tool Co.
Steel Heddle Mfg. Co.
Walraven Co., The

Tachometers.
Tarlabne Mfg. Co.
Veeder Mfg. Co.

Tag Addressing Machines.
Regnas & Co., J. R.

Tallow.
(See Finishing Materials.)

Tanks, Towns and Tubs.
Lombard Iron Works & Supply Co.
Permutit Co.
Phila. Drying Machinery Co.
Textile Finishing Machinery Co., The
Walsh & Weidner Boiler Co.

Tapes and Braids.
American Textile Banding Co., Inc.
Barber Mfg. Co.
Weimar Brothers.

Tape Looms—Cotton.
Fletcher Works.
Schaum & Uhlinger.

Tape—Slasher.
Lovingood Co.
Regnas & Co., J. R.

Tape Making Machines.
(See Bandage and Tape Mach.)

Telephones (Calling System.)
Carter Elec. Co.
Collins, J. D.

Temperature Controllers.
Carrier Eng. Corp.
Parks-Cramer Co.
Powers Regulator Co.
Sturtevant Co., B. F.
Tarlabne Mfg. Co., C. J.

Temples.
Draper Corporation.

Tetring Machines.
Collins, J. D.
Regnas & Co., J. R.

Tenters.
Butterworth & Sons Co., The
Textile Finishing Mach. Co.

Textile Machinery.
(See Cotton Mill Machinery.)

Theatre Equipment.
Lucas Theatre Supply Co.
Southern Theatre Equip. Co.

Thermometers—All Kinds.
Tarlabne Mfg. Co., C. J.
Taylor Instrument Co.

Thin Place Preventers.
Draper Corporation.

Thread Guides.
Mitchell-Bissell Co.
Palmer Co., The I. E.

Ties (Baling).
(See Bale Ties.)

Time Clocks.
International Time Recorder Co.

Tires—Auto and Truck.
Goodyear Tire & Rubber Co.

Toilets.
Crane Co.
Kaustine Co., Inc.
Mott-Southern Co.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.

Tools (All Kinds.)
Crymes Mchry. & Supply Co.
Jones Mchry. Corp.
Pasco Tool Co.
Seeger Machine Tool Co.
Walraven Co., The

Towers.
(See Tanks and Towers.)

Tractors—Electric, Industrial.
Baker R. & L. Co.
Collins, J. D.
Cowan Truck Co.
Elwell Parker Elec. Co.
Hunt Co., C. W.
Mercury Mfg. Co.
Regnas & Co., J. R.

Transmission—Power.
(See Power Transmission Machinery.)

Transfer Points.
Adams Co., Geo. H.

Traps—Return Steam.
American Blower Co.
Morehead Mfg. Co.

Travelers (Spinning & Twisting.)
Dary, Ring Traveler Co.

Trucks—Auto.
Baker, R. & L. Co.
Corbitt Motor Truck Co.
Packard Motor Car Co.
Pierce Arrow Motor Car Co.
Triangle Motor Truck Co.
White Co., The
White Hickory Motor Corp.

Trucks—Electric—Inter
Baker, R. & L. Co.
Collins, J D.
Cowan Truck Co.
Elwell-Parker Electric Co.
Holyoke Truck Co.
Industrial Truck Co.
Hunt Co., C. W.
Mercury Mfg. Co.
Regnas & Co., J. R.

Trucks—Elevating—Inter.
Collins, J. D.
Cowan Truck Co.
Elwell-Parker Elec. Co.
Holyoke Truck Co.
Industrial Truck Co.
Hunt Co., C. W.
Lovingood Co.
McKinney Mf- Co.
Regnas & Co., J. R.

Trucks—Fibre—Inter, Etc.
Diamond State Fibre Co.
Keystone Fibre Co.
Lane & Bro., W. T.
Leatheroid Sales Co.
Rogers Fibre Co.
Standard Fibre Co.

Tubes (Cloth).
Southern Novelty Co.

Turbines—Steam.
Allis-Chalmers Mfg. Co.
Carpenter Co., Geo. B.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Twisting Machinery.
Draper Corporation.
Howard & Bullough.
Leigh & Butler.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Urinals.
Crane Co.
Mott-Southern Co.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.

Unions—Bronze.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.

Valves—Angle, Globe and Cross.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.

Valves—Anti-Acid.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.

Valves—Blow-Off.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.

Valves—Check.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.

Valves—Gate.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.

Valves—Non-return Stop.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.

Valves—Pop-Safety.
Jenkins Bros.
Lunkenheimer Co.

Valve Discs.
Goodyear Tire & Rubber Co.
Graton & Knight Mfg. Co.
Jenkins Bros.

Varnishes.
Barrett Co.
Du Pont de Nemours & Co., E. I.
Hurst Co.
Peaslee Gaulbert Co., Inc.
Sherwin Williams Co.
Wadsworth, Howland & Co.

Ventilating Apparatus.
American Blower Co.
Carlyle & Gale Co.
Carrier Eng. Corp.
General Electric Co.
New York Blower Co.
Parks Cramer Co.
Sargent's Sons Co., C. G.
Sturtevant Co., B. F.
Tolhurst Mch. Co.

Vises and Benches.
Richards-Wilcox Mfg. Co.

Village Architects and Designers.
Aladdin Co., The
Draper, E. S.
Lockwood Greene & Co.
Sirrine, J. E.
Rundle-Spence Mfg. Co.
Tuxbury Lumber Co., A. C.

Village Houses.
Alexander Lumber Co.
Aladdin Co., The
Tuxbury Lumber Co., A. C.

Warehouse Door Hardware.
Richards-Wilcox Mfg. Co.

Warp Drawing Machines.
Cocker Machine & Fdy. Co.
Crompton & Knowles Loom Wks.

Warpers and Warping Machinery.
Cocker Mch. & Fdry. Co.
Draper Corporation.
Howard & Bullough.
Mossberg Co. Frank
Saco Lowell Shops.
Smith & Furbush Mach. Co.

Washers—Cloth.
American Laundry Machinery Co.
Butterworth, H. W. & Sons Co.
Cocker Mch. & Foundry Co.
Philadelphia Drying Mchry. Co.
Phila. Textile Mchry. Co.
Textile Finishing Mchry. Co.

Washers (Leather.)
Graton & Knight Mfg. Co.

Washers—Rubber.
Goodyear Tire & Rubber Co.

Waste Dealers.
Dixie Cotton Waste Co.
International Cotton Products Co.
Rose Co., Edward.
Valley Waste Mills.

Waste Balers.
(See Baling Presses.)

Waste Machinery—Cotton.
Howard & Bullough.
Leigh & Butler.
Saco Lowell Shops.
Sargeant's Sons Corp., C. G.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Co.

Watchman Clocks.
(See Clocks—Watchman.)

Water Coolers (Fountain).
Crane Co.
Mott-Southern Co.
Rundle Spence Mfg. Co.
Southern States Supply Co.

Water Columns.
Lunkenheimer Co.

Water Softeners.
Permutit Co.
Refinite Co.
Scaife & Sons Co., Wm. B.

Water Towers.
(See Tanks and Towers.)

Waterproofing Machinery.
Butterworth, H. W. & Sons Co.
Textile Finishing Machinery Co. The

Weaving.
(See Yarn Manufacturers.)

Welding Apparatus—Electric Arc.
Westinghouse Elec. & Mfg. Co.

Welding Apparatus and Supplies—Oxy-Acetylene.
Bird-Wilcox Co., Inc.
Commercial Acetylene Supply Co.
Linde Air Products Co.
Prest-O-Lite Co.

Welding—Job.
Bird Wilcox Co.
Chattanooga Brazing & Welding

Welfare Architects.
(See Village Architects.)

Welfare Equipment.
Alladin Co.
American Playground Device Co.
Lucas Theatre Supply Co.
Medart Mfg. Co., Fred.
Mott-Southern Co.
Southern Theatre Equip. Co.
Thomas Co., F. H.
Tuxbury Lumber Co., A. C.
Wright Co.

Wheels—Fibre.
Diamond State Fibre Co.
Keystone Fibre Co.
Leatheroid Sales Co.
Rogers Fibre Co.
Standard Fibre Co.

Wheel Puller.
Greb Co., Inc.

Whistles (Electric).
Federal Electric Co.

Whistles—Steam.
Crane Co.
Lunkenheimer Co.

Winders.
Firsching, J. A.
Howard & Bullough, American Machine Co.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Stafford Co., The

Windows—Steel.
Lupton's Sons Co., David
Detroit Steel Products Co.

Wires (Drop).
(See Drop Wires.)

Wiring—Electrical.
(See Electrical Contractors.)

Wood.
(See Lumber.)

Wood Preserver.
Atlanta Gas Light Co.
Barrett Co.
Du Pont de Nemours & Co., E. I.
Hurst Co.
Peaslee Gaulbert Co., Inc.
Sherwin-Williams Co.
Wadsworth, Howland & Co.

Wood Pulleys.
(See Pulleys.)

Woodworkers Benches and Vises.
Richards-Wilcox Mfg. Co.

Woolen Machinery.
Butterworth, H. W. & Sons Co.
Crompton & Knowles Loom Wks.
Draper Corporation.
Schofield Co., Wm.
Phila. Drying Machinery Co.
Phila. Textile Machinery Co.
Sargent's Sons Corp., C. G.
Smith & Furbush Mach. Co.
Stafford Co., The
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Advertisers' Index

Acme Steel Goods Co.....158
Adams, Geo. H. 304
Aladdin Co., The.....45
Aldrich Machine Works.....166
Allen Spindle Corp.....16
Allis-Chalmers Mfg. Co.....54
American Audit Co.....191
American Blower Co.....17
American Cast Iron Pipe Co...181
American Crayon Co.....60
American Kron Scale Co.....167
American Laundry Mchry. Co..145
American Machine Co., H. & B.259
American Playground Device Co. 164
American Processing Co.....157
American Scrubbing Equipment Co. 25
American Supply Co.....100
American Textile Banding Co., Inc. 308
Anchor Post Iron Works.....270
Aniline Dyes & Chemicals, Inc..157
Arabol Mfg. Co.....197
Arlington Cotton Mills.....183
Arnold, Hoffman & Co., Inc...152
Arrow Mills, Inc.....183
Asphalt Roofing Products Co..
Atlanta Audit Co., Inc.....191
Atlantic Dyestuff Co.....152
Atlanta Gas Light Co.....174
Atlanta Rubber Stamp & Stencil Works 193

Baker, R. & L. Co.....197
Barber Colman Co.....193
Barber Mfg. Co.....193
Barrett Co., The 257
Beckley Perforating Co.....168
Beer, H. & B. 182
Benjamin Electric Co..... 53
Bird-Wilcox Co. 174
Borne, Scrymser Co. 154
Bosson & Lane 154
Boston Economy Lamp Div....195
Bradley Mfg. Co., A. J.....284
Bridge & Co., Ltd., David.... 26
Brinton Co., H.....302
Brown Co., David 160
Bryan Electric Co.....180
Butterworth & Sons Co., H. W. 147

Carlisle, Johnson Mch. Co.....197
Carlisle & Gale Co.....286
Carpenter & Co., Geo. B.....176
Carrier Engineering Corp. 272
Carter Electric Co. 180
Carver-Beaver Yarn Co. 193
Chaffee, Thos. K. .....
Chattanooga Brazing & Welding Co. 176
Chicago Watchman's Clocks Wks. 286
Classified Opportunities 185
Cocker Machine & Foundry Co. 146
Collins, J. D. 168
Commercial Acetylene Supply Co. 282
Corbitt Motor Truck Co. 13
Corn Products Refining Co. ...155
Corrugated Bar Co., Inc. 49
Cortright Metal Roofing Co....143
Cowan Truck Co. 32
Crane Co. 175
Cresson-Morris Co. 174
Cromton & Knowles Loom Works 14
Crymes Mchry. & Supply Co...
Cutter Co., Geo. .....

D'Oliver & Co., Franklin.....280
Davis, Roger W. 12
Detroit Steel Products Co. ... 51
Diamond State Fiber Co.....
Dictaphone Co. .....
Dixie Cotton Waste Co. 181
Dixon Crucible Co., Joseph ... 60
Dodge Sales & En'g Co. .....
Dow Chemical Co. 55
Draper Corporation 3
Draper, E. S. 284
Dufur & Co. 193
Du Pont de Nemours & Co., E. I. 151

Economy Baler Co. 193
Economy Fuse & Mfg. Co. ... 54
Edison Storage Battery Co. ... 29
Electric Smelting & Aluminum Co. 308
Electro Bleaching Gas Co. ...143
Elwell-Parker Electric Co. ...
Emmons Loom Harness Co. ..191
Erdle Perforating Co. 195
Excello Mfg. Co. 171

Fawcett, Hughes 182
Federal Electric Co. 23
Felton & Sons Co., S. A. 58
Felton Brush Co., D. D. 58
Fisching, J. A. 308
Flexible Steel Lacing Co.....304
Fletcher Works 7
Flint Mfg. Co. 183

Garland Mfg. Co..... 60
General Electric Co. 57
General Machine Works.....308
Goodyear Tire & Rubber Co.... 34
Grasselli Chemical Co. 149
Graton & Knight Mfg. Co.....278
Gray Mfg. Co. 183
Greb Co. 197
Greenville Spool Mfg. Co. ...160

Hemingway, Inc., Frank 150
Hemphill Mfg. Co. 296
High-Grade Mfg. Co. 172
Holyoke Truck Co. 167
Hotel Marquette 189
Hotel Marquette 189
Hotel Sinton ... .189
Hotel Tuller 187
Howard & Bullough Machine Co. 259
Hunt & Co., Inc., C. W. .....
Hunter Mfg. & Comm. Co.....
Huntington & Gurry, Inc. ...
Hurst Co.,The 172
Hyatt Roller Bearing Co. ....4, 5, 8 and 9

Imperial Electric Co. 195
Industrial Truck Co. 32
International Cotton Products Co. 181
International Eng'g Wks., Inc. 42
International Time Recorder Co.20
Ivanhoe-Regent Works 56

Jenkins Bros. 177
Jewell Belting Co. 306
Jones Machinery Corp. 191
Jordan Mfg. Co. 60

Kali Mfg. Co. 148
Kaumagraph Co. 60
Kaustine Co. 170
Kelly Co., Henry C.....158
Kellogg Co., E. H.....191
Keever Starch Co.....156
Keystone Fibre Co.....166
Klipstein & Co., A.....156

Ladew Co., Inc., Edw. R..... 35
Lane & Bro., W. T.....161
Leatheroid Sales Co.....162
Lemon & Co., G. L.....181
Linde Air Products Co.....
Link-Belt Co. 36
Lockwood, Greene & Co.....171
Lewis, John D. 308
Lombard Iron Works 191
Lovingood Co., The.....166
Lowell Crayon Co. 143
Lucas Theatre Supply Co.....162
Lunkenheimer Co. 179
Lupton Sons Co., David..... 48

McKinney Mfg. Co..... 27
McNaughton Mfg. Co.....197
Medart Mfg. Co., Fred.....165
Mercury Mfg. Co. .....
Merrow Machine Co.....302
Metz & Co., H. A.....153
Mill Supply Co. of Greenville..178
Millers Indemnity Underwriters.268
Mitchell-Bissell Co. 2
Monroe Calculating Machine Co. 21
Morehead Mfg. Co. 179
Morse Chain Co. .....
Mossberg Co., Frank 159
Mott-Southern Co. .....
Myrtle Mills, Inc. 183

Nashville Hardwood Flooring Co. 143
National Aniline & Chemical Co. 200
National Asso. Hosiery & Underwear Mfgrs. 306
National Bank of Commerce in New York 184
National Marking Machine Co. 19
National Shawmut Bank of Boston .....
New Departure Mfg. Co.....286
New York & N. J. Lub. Co... 39
New York Blower Co.....161
Newport Chemical Co. 264
Niagara Sprayer Co. 24
Nye & Tredick 302

Packard Motor Car Co..... 31
Palmer Co., J. E. 160
Paramount Hosiery Form Drying Co. 300
Parks-Cramer Co. 18
Pasco Tool Co. 178
Paulus, Chas. B.....304
Parkdale Mills, Inc. 183
Pearson, Jos. T. 308
Peaslee-Gaulbert Co., Inc..... 50
Permutit Co. 43
Phila. Textile Mchry. Co. 150
Phila. Drying Mchry Co. 198
Pierce-Arrow Motor Car Co....
Portable Mchry. Co. 191
Prest-O-Lite Co., Inc. 261
Powers Regulator Co. 284

Refinite Co., The.....147
Regnas, J. R. 167
Reliance Machine Works.....304
Richards-Wilcox Mfg. Co.....168
Roessler & Hasslacher Chemical Co. 264
Rogers Fibre Co. 162
Rome Mch. & Fdry. Co. 148
Rose Co., Edward 188
Roy & Sons Co B. S. 16
Rundle-Spence Mfg. Co. 168

Saco-Lowell Shops 12
Sargeant's Sons Corp., C. G...146
Scaife & Sons Co., Wm. B....193
Schaum & Uhlinger 7
Schofield & Sons Co., J. S.....176
Schofield Co., Wm.....197
Scott & Co., Henry L.....165
Scott & Williams 289
Seeger Machine Tool Co.....178
Shambow Shuttle Co. 58
Sherwin-Williams Co. .....
Sherwood Mfg. Co. 177
Signode System, Inc. 158
Sirrine, J. E. 46
S K F Industries.....274
Smith & Furbush Mch. Co. ...158
Southern Cotton Yarn Co.....182
Southern Novelty Co.....166
Southern Spindle & Flyer Co..195
Southern States Supply Co.....276
Southern Theatre Equip. Co.... 22
Southwark Fdry. & Machine Co. 25
Stafford Co., The 6
Standard Fibre Co.....187
Standard Scale & Supply Co...164
Stanley Belting Corp. 173
Steel Heddle Mfg. Co.....162
Sturtevant Co., B. F..... 15
Surpass Chemical Co. 154
Swan & Finch.....284

Tagliabue Mfg. Co., C. J.....148
Taylor Instrument Co. 173
Terrell Machine Co.....282
Texas Co. 41
Textile Banking Co., Inc.....184
Textile Finishing Mchry. Co...198
Thomas Co., F. H.....
Tolhurst Machine Works.....144
Toomey, Frank, Inc. 185
Torsion Balance Co. 198
Triangle Motor Truck Co..... 58
Tuxbury Lumber Co., A. C.... 44

United Chemical Products Corp.189
Universal Winding Co.....195
U. S. Ball Bearing Co..... 40

Valley Iron Works 37
Valley Waste Mills 1
Veeder Mfg. Co. 159
Vogel Co., Jos. A.....179
Vortex Mfg. Co., The..... 52

Wadsworth, Howland & Co.....170
Walraven Co., The.....175
Walsh & Weidner.....176
Want Ads. 185
Waren Soap Mfg. Co. 152
Wayne Oil Tank & Pump Co..199
Weimar Bros. 182
Westinghouse Electric & Mfg. Co. .....10 and 11
Westinghouse Lamp Co. .....
White Company 30
White Hickory Motor Corp.... 33
Whitinsville Spinning Ring Co. 12
Whitin Machine Works..... 14
Whiton Machine Co. D. E.....174
Wildman Mfg. Co. 298
Willcox & Gibbs Sewing Mch. Co. 290
Williams & Sons, I. B..... 38
Wolf & Co., Jacques.....150
Woodward, Baldwin & Co.....182
Wright Co. 163

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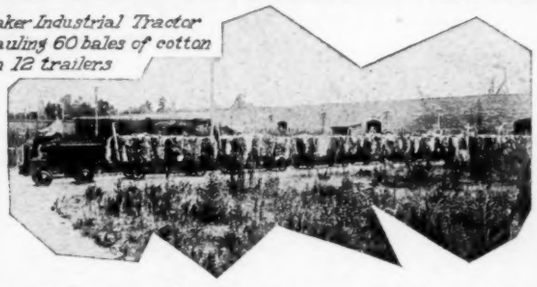

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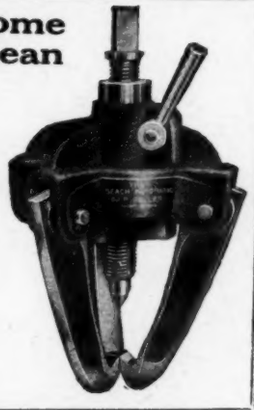

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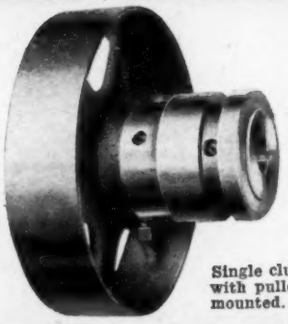

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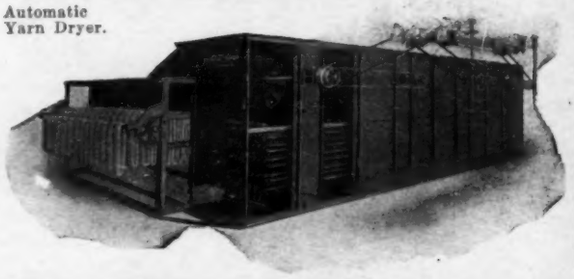

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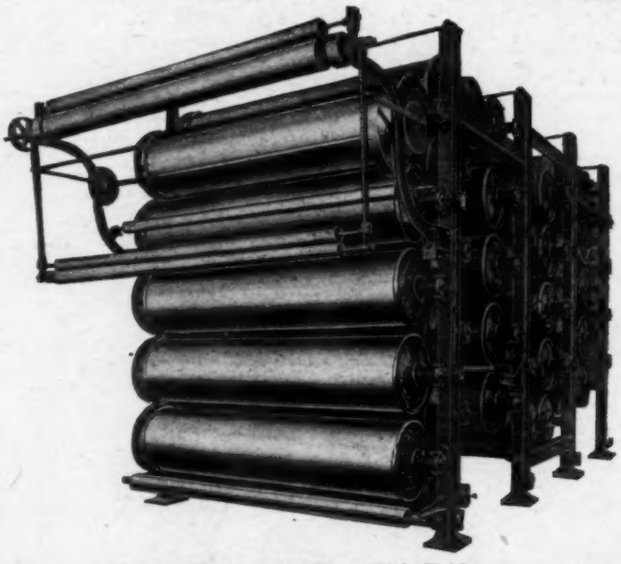

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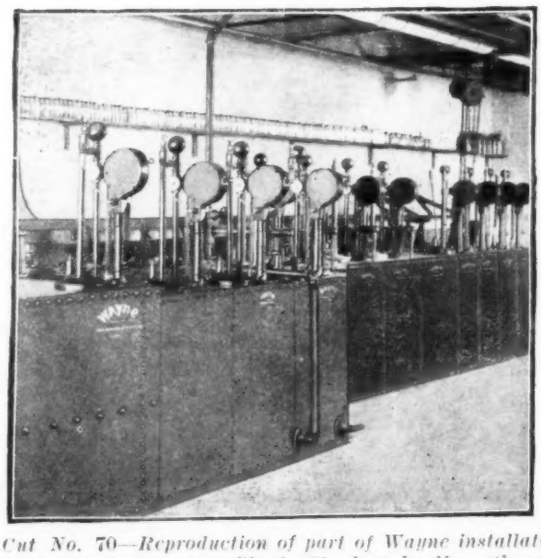

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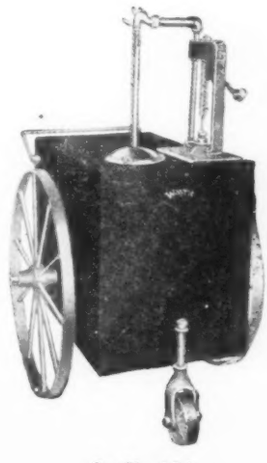

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